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THE REPLY TO BILL BOWLINE.

BY CAPT. F. D. HERRIMAN.

An article in *Shipping*, New York, under the caption of "Barks in the Dog Watch," by Ropesender, tells a good story of an old sailor, who has taken a day off duty for a cruise about New York.

He goes by the name of Bill Bowline, the Ancient Mariner, who has sailed the salt seas over for 40 years.

When we first make Bill out, he is making a long and short leg down Broadway, loaded to his Plimsol summer mark with New York whiskey.

As he checks in, at the head of Wall street, to make the run of that treacherous channel, where by means of false lights and shifting sands, so many have stranded and abandoned ship and cargo to the Wall Street Pirates, he got the hands of the clock on Trinity church and the points of his compass so tangled up, that he was at loss how to steer to make his port.

And when the next morning he sat up in his bunk, lit his pipe, and overhauled his log of the past 24 hours, he marvelled that he succeeded in safely reaching his ship, without collision with the police or something worse.

"When we next saw the Ancient Mariner," says Ropesender, "he was looking at a drawing in the MARINE REVIEW, of an old-time clipper ship under full sail, and it is his criticism of the drawing that we are now to consider."

We have, as we believe, good grounds on which to take exceptions to Bill as an art critic, or even a good sailor, notwithstanding his 50 years at sea, and if we were sure our Ancient Mariner was not again muddled with that New York whiskey when he decided to publish his views of the drawing and ask for explanations, we would recommend that his A. B. certificate be suspended, and he be made to plat seven stran sennet, or pick oakum, under the lee of the long boat in his watch below, until he has given due thought to the art of setting studding sails, that will draw and be helpful with the lower yards on the back stays.

We must decidedly differ with the Ancient Mariner as to the proper trend of the signals at the spanker peak, under the conditions in which the artist represents the ship. The following is the language used by our critic on viewing the drawing:

"Here's a drawing o' the old Yankee clipper Flying Cloud made by some chap who calls hisself Capt. Herriman. He's got the old floating workus close-hauled on the port tack with stuns'ls on the fore and a to'ga'nt stuns'l on the main. She must h' the wind off the port bow, accordin' to the way her flags is a-flyin' from the spanker gaff. Now I've been shipmates with stuns'ls many a time in my day, though ye don't offen see 'em now, an' I never yet see 'em rigged out when the wind war forrard o' the beam. But if the wind warn't forrard o' the beam, then her signals wouldn't stream out aft the way they do. If there ain't somethin' out o' gear with the old craft or the artist-skipper who drawed her, then Bill Bowline has sailed salt water 50 year fer nothin'."

Our Ancient Mariner states that he has sailed the salt seas for 50 long years. During this time he must have crossed and recrossed the belts of the northeast, and southeast, trade winds, in the four oceans, many times. And if while in those regions of gentle steady winds, soft fleecy detached clouds, and light blue sparkling waters, he has never seen studding sails set with a beam wind, or with the lower yards on the backstays, it would be interesting to other old-timers, as well as the artist-skipper, to know what ships he has sailed in and who commanded them. For in those stirring times when our merchant marine dominated the carrying trade to all parts of the world, not only the long voyage clipper ship, but the South American, and West India trader, carried full sets of studding sail, and the seaman that could not send out, and so set a topmast as topgallant studding sail that would draw and be helpful with a beam wind, was not, and could not, be considered an able seaman.

Regarding the trend of the signal flags at the spanker peak, according to Bill's views they should trend as the wind blows. He does not take into consideration the deflection of a beam wind, and the impetus of a 10-knot gale through the air. Under the conditions represented in the drawing, the wind will strike the sails obliquely from forward aft, and the trend of the flags at the spanker peak will be affected in accordance with the force of the wind.

In the drawing the flags at the spanker peak are tailing four points abaft the beam.

Now lay the yards on the main aback, so that the ship will have steerage way only, but keep his course, and the trend of the signals at the peak, will still point more or less abaft the beam, owing to deflection from the sails on the mizzen.

Now take all sail off the vessel so she will lay dead in the water with her head still on her course, and the

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signals will trend square off the beam to leeward, as Bill wants it.

Note the flags of the fast river steamers. Their trend as she cleaves the air will often be dead astern, although she may have a good breeze abaft the beam.

We note, too, that our critic is in doubt as to the artist's claim to the title of Captain. The drawing was signed F. D. Herriman, but the MARINE REVIEW honored the artist by the prefix of Captain. But it is only fair, that our A. M. is put right on this point.

F. D. Herriman, the artist-skipper, is now past the three-score-and-ten mark and consequently contemporary with the Ancient Mariner in the palmy days of the American clipper ship.

He is one of six brothers that were born and bred to the salt sea. Their father before them was a ship master of great energy and ability, and founder of the so-called Eastern Steamship Co.

The six brothers at one and the same time commanded such well known ships as the Prima Donna, P. R. Hezeltine, Ivanhoe, City of Brooklyn, America, and Sontag.

The artist-skipper spent some 30 years at sea and commanded several fine vessels. So we claim he is entitled to the Captain before his name.

But notwithstanding the fact that our summing up and finding is adverse to Bill Bowline as an art critic, or efficient seaman, we have a soft spot in our hearts for him, for the artist-skipper, also an Ancient Mariner, must have sailed the same seas at the same time in the long ago.

Institution of Naval Architects

A paper on "Unsinkable and Uncapsizable Ships of the Goulaeff Form and System of Construction," prepared by Gen. E. E. Goulaeff, who was detained in St. Petersburg, was read by Mr. Tennyson at the Institution of Naval Architects. An abstract of this paper will be published later in the REVIEW.

Monsieur Bertin, who opened the discussion, said he felt peculiarly interested in the clear and conclusive account given of the system, and he wished Gen. Goulaeff every success. Proceeding, he said he would put aside, on account of its complication, the lessening of inclination from the position of equilibrium. This lessening it would not be possible to calculate today. Taking account of it would be favorable to Gen. Goulaeff's argument in some cases, and unfavorable in others, in proportion to the part played by the stability. It was obvious that on ships of small stability there was a straightening effect by which the position of equilibrium might be upright on the slope of the waves, and even inclined opposite to the slope. As for the effect on the main deck at small inclinations, and the saving in the weight of armor, these had been the chief reasons upon which he decided to venture on the building of the Henri IV. The advantages foreseen from those two points of view gave place to no deception. He wished to point out too that the study of stability limited to statical stability was not sufficient. A warship when damaged in action might keep a convenient statical stability with small inclination, but be in danger of capsizing by the dynamical effect of some moment of inclination such as might be produced by the action of the rudder. That had been the case with some ironclads of ordinary form, and was proved 30 years ago in the case of the Connere. That danger was increased when the area of the waterline was decreased by the battering of the enemy's artillery even when there was no successful torpedo attack. The protection of stability requisite from this point of view was easily determined either by calculation or by experiments on models. Its necessity had been proved by several catastrophes, notably the loss of a Chinese cruiser at the battle of Yalu. It appeared, however, to be without doubt that the study of the danger of dynamically capsizing ought to be conclusive in favor of Gen. Goulaeff's design. There were two possible dangers against which he wished to warn Gen. Goulaeff. On passenger ships, where the space for the passengers was never considered sufficiently roomy, the profile of ships given in Fig. 1, Plate 1, would not be easily accepted. On warships there would always be some objections to the amplitude of rolling indicated in what were the ordinary conditions of sea in fighting weather. Rolling of 2 degrees or 4 degrees of half amplitude was troublesome for the gunner, and could put a ship in a state of inferiority against an adversary of ordinary form which would have no rolling at all. On big waves and in bad weather the figures given by Gen. Goulaeff were quite conclusive, and had been confirmed by the performance of the Henri IV. On small waves and in fine weather the question was not completely settled.

Admiral Fitzgerald said he viewed the matter from a seaman's point of view. Russia had always hankered after breadth of beam. In the last naval war several battleships were sunk by ground mines, but he did not think one was sunk by locomotive torpedo fire at the side where the corridors were to be placed. With double the breadth of beam a ship would have a double chance of picking up a ground mine. He did not see how a ship could be unsinkable, although it might be uncapsizable when blown up by a ground mine. As to speed, no doubt a broad, shallow ship was capable of great speed, but it was only smooth water speed. In rough water, for the reason that the ship would pitch her screws out of the water, the high speed could not be maintained.

Prof. Biles said the paper opened up a wide subject. The idea of increasing and taking advantage of increased breadth in ships was one which had pervaded the institution for many years. He thought at the present time it might be said that the general tendency of forms of machinery was such that they wanted area rather than volume. Then the limitation of strength came in and prevented vessels from being long and shallow, and to some extent forced them to a broad, shallow ship to get the maximum advantage out of the design. But figures showed that within the region of the size of waves common at sea a broad ship was not so good for passenger or warship work as a narrower ship with a smaller stability. Of course, when they got beyond waves of 500 ft. the advantage of a larger beam was apparent, and they had, therefore, to consider what was the probability of their meeting with waves that were over 500 ft. as compared with those that were under 500 ft., and also to consider what was the effect of the probability on passengers and sea fights. Judging by his own experience, a great deal more weather was associated with waves under than over 500 ft. For that reason he would prefer to be in a ship suited to

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waves below rather than above 500 ft. So in regard to the passenger, bigger breadth was not an advantage in a sea-going ship. When they came to warships they had to consider what was the probability of an action being fought in weather of waves over 500 ft. He was not very familiar with the history of all naval actions, but he thought that, generally speaking, actions were fought in weather that certainly would be characterized by waves of less length. Therefore it was much more likely that they would find that a broad ship had a disadvantage over a narrow ship in the matter of war. The question of resistance he had not personally gone into, but Archibald Denny, who, unfortunately, was not able to be present, had got out figures which did not agree with those of Gen. Goulaeff. He thanked the author of the paper for bringing the matter forward, but he was not quite sure that he had made out his case.

Mr. Whiting said Gen. Goulaeff had shown a characteristically Russian boldness of conception and also determination to follow out the idea to its logical conclusion. Though they might not agree with the plan, anything which held out any promise of guarding battleships against sudden losses in naval warfare was well worth consideration. He would like, however, to point out that the statements made in the first paragraph of the paper were really not true as regards British battleships, and the examples given in the first paragraph were distinctly misleading. The Victoria was in no sense representative of warships today. Substantially, the proposal was to reduce draught from 27 ft. or 28 ft. to 21 ft., and increase the breadth from 83 ft. to 113 ft., the displacement remaining constant. That meant that they were to abandon the very cheapest form of protection they had, namely, the keeping of important portions of the vessel under water. They would have to raise a very large part 7 ft. Then there would be difficulty in the allocation of hold space, and all manner of difficulty in means of access to different places and means of communication between them and means of transmitting power. All this would be brought nearer to the deck, the very thing they had been trying to avoid, and they would have what he might call the arterial system put in as exposed a position as possible. The ship would therefore be much more open to gun attack. Then came a question of how far the avowed object of the proposed change was really achieved. He thought more detailed examination was needed before they were led to such a great change in practice as was proposed. Gen. Goulaeff seemed to have started with an exaggerated idea of the risks which a well-designed modern warship ran, grave as they were undoubtedly. The proposal would involve great difficulty in arrangements; a reduction in average efficiency of defense could do very little to secure the avowed object, which was to guard against serious injury by torpedo attack, and would increase in a marked degree the risk of destruction by gun fire.

Mr. Tennyson, in replying to the discussion, said that with reference to dynamic versus statical stability, he supposed Gen. Goulaeff was quite aware of the point, but the reason why he considered principally torpedo instead of shell fire was—as he understood it—that a modern ship did not, from a structural point of view, fear shell fire so much as it did torpedo fire. In any case the stability of a Goulaeff type of ship was such that it would not allow her to get such dangerous heels as an ordinary ship would get. It had been remarked that the draught being decreased would lead to getting more of the vital parts of the ship near the waterline, but the draught remained so considerable that it was not a serious point.

Capt. T. J. Tresidder's paper on "Modern Armor and Its Attack" was read in his absence by Mr. Ellis. This paper and the discussion upon it we hold over till next week.

The next paper was entitled "MODERN TORPEDO BOATS AND DESTROYERS," by J. E. Thornycroft, associate. A great deal of it is historical and a little of it mildly critical. The restriction imposed by admiralties renders it very difficult to say much nowadays about ships of war. After tracing the development of the destroyer, Mr. Thornycroft discusses the torpedo boat. His remarks on the use of the turbine and oil fuel are worth consideration.

While the turbines have given excellent results in these vessels, it is a question if equally good results would not have been obtained with twin-screw reciprocating engines and oil fuel, as while the merits of turbines for larger vessels are admitted on all hands, there is considerable doubt, when powers of less than 3,000 or 4,000 indicated horsepower are required, if the greater simplicity of reciprocating engines is not to be preferred. The necessity of adding a cruising turbine, and, owing to the high speed of revolution, of adopting at least three shafts, makes it extremely difficult to arrange the engine room satisfactorily in such small vessels. No doubt with experience it will be found possible to simplify to some extent the arrangement of pipes and auxiliary engines, but in their present form these adjuncts amount to so much that the fitting of the machinery on board becomes an extremely costly matter, and when it is necessary to open up, an enormous amount of work is entailed. It is thought that it will always be found necessary to put these vessels in dock yard hands if any adjustments have to be made to the machinery, as it will be quite impossible for the crew themselves to deal with adjustments without greater facilities than can be provided on the vessels.

It is believed that it will soon be recognized that the procedure which has always obtained with regard to opening up the machinery after the contractors' trials, and the periodical opening up for inspection, should, with turbine machinery, be discontinued, as not only are so much labor and time wasted, but considerable risk occurs every time the engines are opened up. When once they have been properly adjusted there is not the same reason for examining the rotors, etc., that exists for looking at the pistons and slide valves of reciprocating engines.

The arrangement of turbines that Messrs. Parsons have thought best for smaller powers, from considerations of simplicity and lightness, is that of three shafts, viz., the high-pressure turbine on one wing shaft, the intermediate-pressure turbine on another, and the low-pressure turbine, of more than one-third power, on the center shaft. As the reversing turbine is necessarily a part of the low-pressure turbine, only one shaft is available for astern going, so that from the control and steering point of view, the vessel is practically a single-screw one. Some of the earlier turbine vessels did not have a very good astern power, but in the later torpedo boats, and particularly in the 33-knot destroyers, the astern going power has been enormous, the latter vessels being capable of making upwards of 25 knots astern.

When considering the advantages of employing oil fuel for this class of vessel, its comparative high cost and the difficulty in obtaining it must not be overlooked. The features that strike those who are actually working the vessels most forcibly are the absence of dirt and cinders and the saving in stokehold staff, the moving of

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the fuel and stoking being effected by steam pumps and pipes instead of stokers and trimmers. With coal-fired torpedo boats it may be taken that the stokehold staff will be quite three times as great as with oil-burning boats, and while with coal-firing at full speed it is usually difficult to maintain sufficient steam, in practice it is found that oil-fired boilers are blowing off, or are on the verge of doing so, and when the vessel is eased up, the boilers are under such perfect control that the safety valves do not lift. The necessity of easing down gradually to avoid blowing off with coal-fired boilers is, of course, thoroughly appreciated.

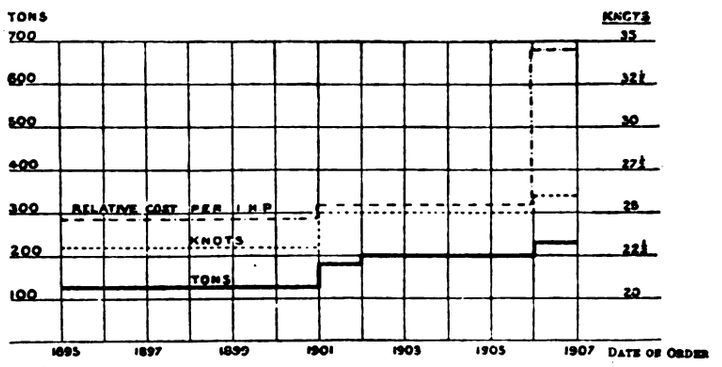
The evaporative value of oil may be taken as one and a third times that of coal, and while 43 cu. ft. of bunker space are required to stow a ton of coal, 38 cu. ft. of space are required to stow a ton of oil, so that the equivalent amount of oil fuel can be stowed in 70 per cent of the space required for coal.

The consideration of cost is not of the first importance in fuel for warships, but it is worthy of note that the most recent oil tank steamers have not been fitted to use oil fuel on account of the cost, although some years ago, when Sir Fortescue Flannery read a paper on the subject at the institution, it was expected that many vessels would soon be so fitted.

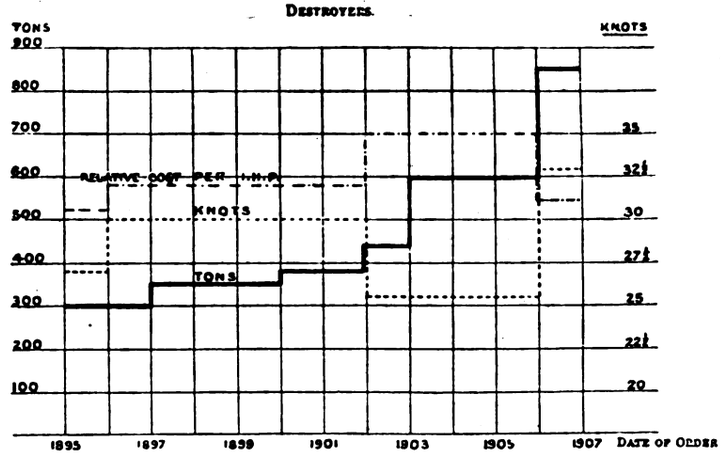
It will be noted from the diagram showing the increase in size of torpedo vessels, that in the case of the torpedo boats the tonnage, speed, and price per horsepower have varied in approximately the same proportion; but as soon as the change to turbines takes place, the price per horsepower goes up very considerably. In the case of destroyers, the diagram shows that the price per horsepower also varies approximately in proportion to the increased size of boats until the inroduction of the turbines in the 33-knot destroyers, when, owing to the very great power developed, the price per horsepower actually falls instead of increases.

DIAGRAM SHOWING DEVELOPMENT IN SIZE, SPEED, AND RELATIVE COST PER I.H.P

TORPEDO BOATS.



DESTROYERS.



The paper concludes with a plea for greater simplicity.

It is admitted, says the author, that to ensure freedom from breakdowns and general efficiency in service with such small vessels every possible complication must be avoided in the machinery and mechanical devices, but with torpedo boats, like all other ships, every new class seems to require something adding to increase the complication. It is thought that the time has arrived when every effort should be made, particularly where turbine machinery is employed, to reduce the number of auxiliary engines. This suggestion will be better appreciated when it is known that in the latest turbine destroyers there are 21 independent steam pumps, besides fans, electric light, and other engines.

An effort has been made by Messrs. Yarrow to attain this end in the destroyers building for the Brazilian government by fitting two very large boilers instead of four. The resulting simplification and economy in construction are, of course, great, besides a considerable saving in weight, but the advisability of using boilers in units of upwards of 4,000 I. H. P. is thought to be open to question.

The policy of some naval authorities to duplicate everything from the main feed pumps to the sirens is thought to be a mistaken one. The reserve pumps, or whatever pieces of mechanism it may be, that are in duplicate ought not to be required to be brought into operation, and in ordinary commercial engineering do not usually exist. In a battleship, which will go on fighting after receiving a great deal of punishment, the conditions may be different, but the torpedo boat or destroyer either escapes or is damaged to such an extent that no duplication will save it.

Sir Phillip Watts, in opening the discussion, said the paper contained an interesting review of the development of the torpedo boat and torpedo boat destroyers in recent years. It was a great advantage to have such a record from the point of view of one of the most successful firms of builders. It was not correct, however, to say that the 30-knot destroyers were 4½ knots faster than the river class. Under similar conditions of lading, and especially in ordinary weather at sea, the classes were practically of the same speed. Of the new 33-knot destroyers five were nearly completed—one of them, the Cossack, having been taken over by the Admiralty—and seven were being constructed. These vessels carried a load between the other two classes, but somewhat closely corresponding to that carried by the river class. The decision to build vessels of this type was come to by the board of admiralty in the spring of 1904, and was based on an outline design prepared at the admiralty for vessels of 900 tons displacement. It was found that there was considerable doubt as to the practicability of obtaining such a speed under the conditions indicated. Only five firms sent in tenders—Arm-

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strongs, Hawthorns, Lairds, Thornycroft and White. The dimensions given in the tenders were as follows:

	Length.	Displacement.
Armstrongs	238½ ft.	600 tons.
Hawthorns	235 ft.	500 tons.
Lairds	260 ft.	650 tons.
Thornycroft	255 ft.	650 tons.
White	250 ft.	540 tons.

Orders were finally placed with each firm for one vessel. The dimensions of the actual vessels were:

	Length.	Displacement.
Armstrongs	250 ft.	860 tons.
Hawthorns	255 ft.	865 tons.
Lairds	270 ft.	890 tons.
Thornycroft	270 ft.	895 tons.
White	270 ft.	890 tons.

By that it would be seen that considerable modifications were introduced by the builders acting in conjunction with the board of admiralty. All the designs were most carefully worked out in every detail and brought into line, most of the parts being interchangeable, and the main engines, for instance, were practically the same in each boat. All the vessels had now been run over the measured mile. The trials were not yet complete, but as a class they had got their speed, and the results had quite justified the original anticipations of the government. Another point to which he wished to refer had to do with Mr. Thornycroft's statement concerning the speed of the Tartar. He said, "The Tartar, the fastest of the class, has maintained a speed of 35.36 knots on a continuous run of six hours, or practically 10 knots more than the river class could maintain on a four instead of a six hours' trial." He did not concur with that statement. If Mr. Thornycroft had stated that the Tartar was six knots faster than the river class when similarly laden, he would not have been far wrong. Sir Philip went on to say that it had been known for many years that while over a great range of speeds for a given vessel shallow water involves an increase of resistance and a falling off in speed, yet, on reaching a sufficiently high speed the resistance becomes less than that in deep water, and the speed attained is, in a corresponding degree, increased. If facilities for running high-speed vessels of this type in deep water existed at several points round our coast it would be very easy to prescribe that all trials should be made in circumstances in which the recorded speeds might be accepted without correction; but the only course of the kind at present was at Skelmorlie. In the "river" class the effects of the Maplin course was to diminish the speed, and if the speeds recorded had been taken without correction, some of the class would have failed to attain the specified speed. It was necessary either to make an allowance for the effect of depth, or to run the vessels in deeper water, and no injustice was done to the river class in this case. Our present need was fuller information on this matter, in view of its increasing importance. The institution had already in its records Captain Rasmussen's paper on the Danish torpedo boats experiments, the valuable account of Colonel Rota's model experiments at Spezzia, and the papers contributed by members of Messrs. Yarrow's firm; and he was able, by the kindness of Messrs. Denny, to contribute for record in the "Transactions" the data obtained from some valuable experiments made by them only a few months ago with models of vessels of the form and displacement under consideration. Sir Philip concluded by saying that steps would be taken by the admiralty to obtain a series of experiments with the 33-knot vessels in order to get more adequate data.

Admiral Sir Cyprian Bridge said that the torpedo boat destroyer was the only man-o'-war of any class, from the biggest to the smallest, which was evolved from deliberate strategical and practical experiments carried on for some considerable time beforehand. Referring to the fact that the Tartar, intended to be a 33-knot boat, had under certain conditions developed 35.36 knots, Sir Cyprian said that it was essential that officers in command of such boats should know exactly what speed their vessels were capable of attaining. If a fair and equitable system of trial trips could be devised it would be greatly in favor of the efficiency of the class.

The Hon. Chas. Parsons, dealing with the relative merits of turbines and reciprocating engines, said he thought Mr. Thornycroft did not state the case fully enough. He did not give the radius of action of the "coastal destroyers," or of smaller boats equipped with reciprocating engines. In the absence of this information it was very difficult to argue the case. Mr. Thornycroft stated also that since the change to turbines took place the cost per horsepower had gone up considerably, but when they came to very large powers—in the 33-knot destroyers—the price fell. Surely, however, some consideration must be given to the dates when the boats were built. It was questionable if the price could really be compared. In fast vessels on the whole the turbine was cheaper than the reciprocating engine. At least he had that opinion, and it would be interesting to hear what others had to say.

Sydney Barnaby, referring to the question of freeboard, said the idea seemed to have been to keep the boats as low as possible in order to get invisibility; but while it was a good thing for a torpedo boat, it was not so in the case of a destroyer. In such a vessel they wanted a good gun platform and a good all-round view, and increased seaworthiness was more important than the question of invisibility. He thought Messrs. Yarrow were the first to point out the advantages of a deep rudder. The types that were seen were very diverse. When going astern at full speed the form of rudder usually adopted had one disadvantage—that the water boiled up at the stern, and there was thus an increased twisting movement and difficulty of control. If it were considered necessary to control the rudder at the maximum speed there might be advantages in such a form as was adopted when the area of the rudder extended above the water line.

Sir John Thornycroft differed from Sir Phillip Watts in his comparison of speeds. He thought the number of knots Sir Phillip had cut off in the case of the Tartar was excessive, and he would put a figure nearer that given by his son.

Admiral Sir G. Noel said speed was not the only necessity in a destroyer, and he hoped armament would also be considered. It was absolutely no use for a destroyer to be speedy enough to overtake the enemy if it were not then able to sink it. Armament at present was absolutely inadequate, but he understood the Admiralty intended to increase it.

He further urged that as no British possession produced oil fuel, it was a question for mature consideration whether it was wise to equip war vessels for such fuel. Moreover, the protection afforded by coal in bunkers was dispensed with if oil fuel were employed.

In reply to Sir Phillip Watts, Mr. Thornycroft said that as the Tartar had run her trials on the buoyed course of an admiralty measured mile which had been approved for the trial of the particular vessel, he thought he was justified in describing the speed as that officially recorded, and as the depth of water—about 10 fathoms—at which the trial was run was a depth at which destroyers might be expected to perform a large part of their service, it was unreasonable to make any deduction in speed for any advantage which might be shown at this depth over a greater depth for this particular speed and size of vessel; further, no corrections had ever before been made and very little was known about the subject.

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Protection of Superior Entry

George A. Wieland, of Duluth, has submitted to the committee on rivers and harbors of the house of representatives a plan for the protection of the entrance to Superior harbor as follows:

The undersigned, who has given much careful thought and study to the subject of "breakwaters and harbor protection," begs to hereby call attention to the fact that the plan as now adopted and designed to protect the entrance to the harbor at the city of Superior, Wis., can in no way give such desired results, but is open to many and very serious objections, and if carried out it must eventually prove an absolute failure.

It not only does not "protect," but such entrance would become a very serious menace to all entering boats, and at the same time very materially increase, at both the Superior and the Duluth entries, the heavy tides or currents now encountered at such points.

A copy of the plan as now proposed and adopted is hereto annexed, marked "Tracing No. 2." Hereinafter I will also submit for your consideration a plan for such protection at the Superior entry as will afford all the desired results and not be open to any one of the numerous and very serious objections that can be raised in relation to the plan contemplated at present. A sketch of my plan is also annexed hereto.

The objections to the plan as now adopted for such Superior entry are briefly stated as follows:

1. One of the objects desired to be accomplished by the plan adopted is, of course, to prevent the heavy seas from running in and damaging property in the harbor. This the present plan can accomplish only to a limited extent, as the outer opening or entrance through the breakwater is to be 600 ft. wide, and that only 950 ft. out from the present pierheads, but slightly preventing the heavy seas from directly entering the inner harbor.

2. It is now fully recognized and admitted by all vessel men of experience in these waters that the dangers and difficulties now encountered in entering the Duluth-Superior harbor are almost entirely due to the heavy adverse currents met at the entrances. These currents may run in or out at any time, but when running out during a heavy storm will cause a tremendous sea and an exceedingly dangerous condition for an entering vessel.

This condition can in no way be improved by the plans adopted, but on the contrary it will become very much worse, not only at the Superior entry, but at the Duluth entrance as well, as the direct result of this attempted protection to the Superior entry.

The plan as adopted, as will be seen by the tracing referred to, shows a breakwater consisting of two rubble mounds, beginning at a point 950 ft. out from the present entry, diverging at an angle and ending on the shores of Minnesota Point and Wisconsin Point, respectively. It will also be observed that the combined length of the two sections comprising said breakwater is considerably over a mile; that said rubble mounds slope into the water on a slope of 1½ to 1, the top of such mounds extending 8 ft. above the low water level of the lake. Now, in a northeast storm the water level of the Duluth-Superior end of Lake Superior rises anywhere from 2 to 4 ft. above the mean level, which, at the maximum quoted, would leave the apex of such rubble mounds but 4 ft. above the lake level. In a work entitled "Wave Action," by Capt. Gaillard, on page 82, he reports waves at the outer end of the Duluth ship canal to the height of 23 feet on Sept. 24, 1901. This would give some intimation of what would happen during any big storm. These rubble mounds would be converted into dangerous reefs, and the heavy seas, striking them at such an angle and on the slope of 1½ to 1, would run over their entire length and pile up an enormous amount of additional water in the harbor, all of which would have to be discharged through the entrances, and thus such currents would be vastly increased, not only at the Superior entry, but at the Duluth entrance as well.

3. Any heavy sea upon striking such rubble mounds, as above stated, would follow such mounds to the shore, creating such a heavy current and undertow as would steadily wear away the sand at the shore ends and ultimately cut through the "points" or natural breakwaters. This effect is sought to be obviated in the plans as now adopted by the placing of riprap along the shores for a short distance; but I am convinced that, to be effective, such riprap would have to be extended at least a full half mile in either direction from where the two sections of breakwater join the shore. In a heavy storm coming from seaward there is a considerable movement of the surface of the water in the direction of the wind and waves, and, as the water can not remain on the shore nor return on the surface, it causes a heavy undertow on the shore or beach and a reflex motion of the water some distance below the surface.

This reflex motion or undercurrent always takes place while a storm is active or increasing, but ceases when the cause is removed. This also explains the fact that beaches are nearly always carried out during the first part of a big storm and are replaced only after its climax and while going down. In some cases, where a heavy rain beats down the waves at a period of highest storm, beaches are not replaced until some later storm performs the work. A sudden strong wind from an opposite direction could have the same effect, or a storm continuing in the original direction but coming a gradually decreasing distance could also prevent the remaking of a beach. Thus, it will be seen, beaches are always replaced in about their natural position so long as natural conditions prevail; but when any unnatural or artificial barrier is interposed to the natural forces above described (such, for instance, as these projected breakwaters at the proposed angle and connected with the shore) it is bound to produce conditions that, to say the least, have not been accurately estimated.

4. It is also but natural to expect that the same conditions above described will operate to steadily cut away the sand along the seaward side of and underneath the rubble mounds, and so gradually undermine the structures.

5. A further and very serious objection to the plan as now adopted is the fact that a large amount of sand will be carried over the rubble mounds and surely fill the stilling basin; and, in turn, when the current is running out much of this sand will be carried through the outer entrance and form a bar directly across such entrance, as is always the case where such conditions exist. It would be a big, if not impossible, task to keep both the channel and the approach to the outer entry free from these deposits, for a single storm of the usual duration is easily capable of creating such a bar, which hidden obstruction will have to remain, not only during the entire storm, but until weather and other conditions admit of dredging.

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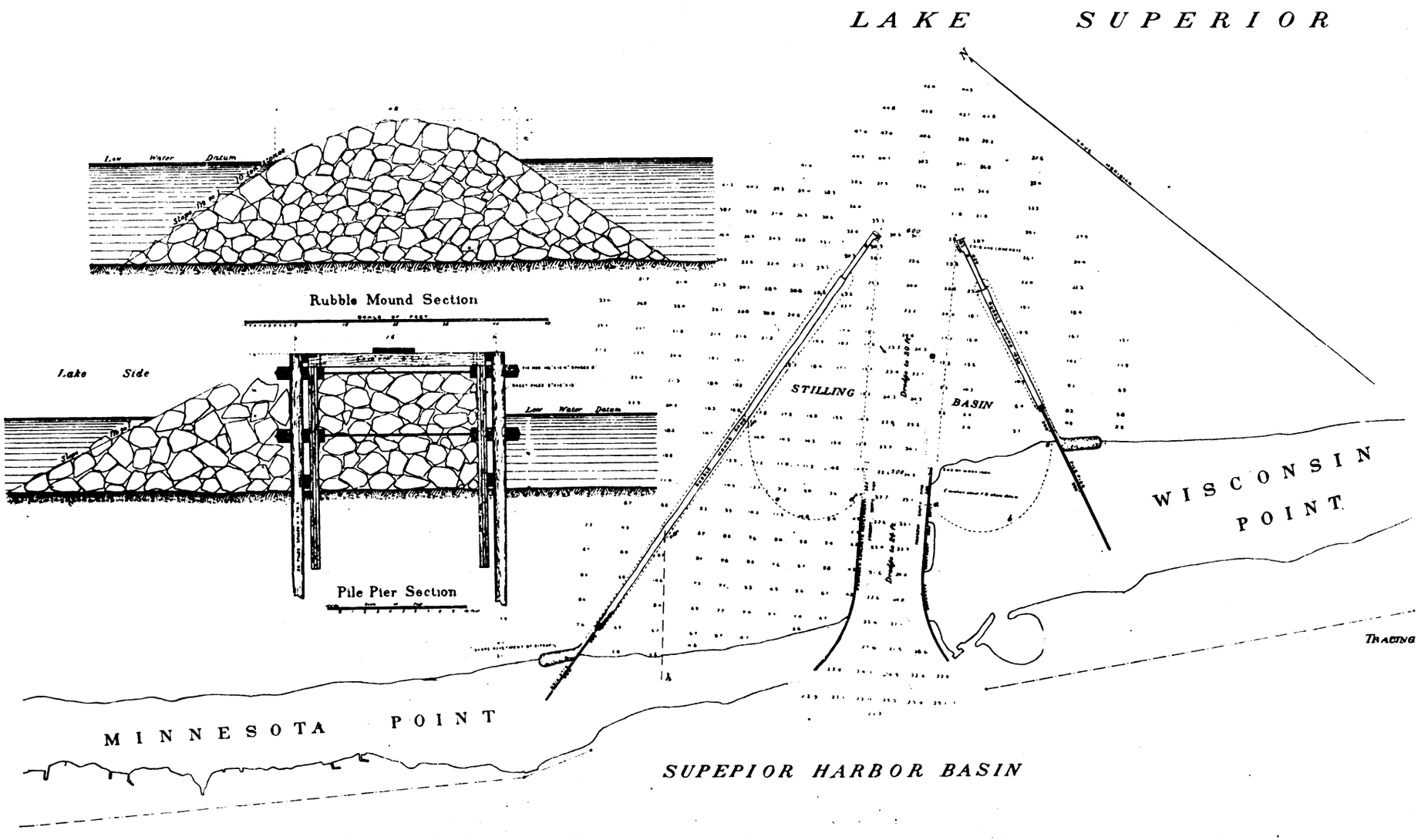

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6. Experience has shown that in spite of skill, precaution, and powerful machinery, vessels in trying to enter a harbor in a big storm will miss the entrance and be seriously damaged or become a total loss. At the Duluth entrance boats have been totally wrecked and a considerable number of lives lost. Many others have only narrowly escaped. Navigators of Lake Superior will try to ride out a storm, or will seek shelter among the Apostle Islands, rather than attempt to enter the Duluth-Superior harbor during a heavy northeast storm, and doubtless some of the wrecks occurring on the north shore of Lake Superior and among the said islands were the result of attempts to avoid the danger of making this harbor at such a time.

The conditions last alluded to would be even more grave in the event of the construction of the breakwater as at present proposed, as there would be little or no opportunity for the vessel to recede after having approached the Superior entry in a storm; and should she miss the one chance to enter she would become almost instantly a hopeless wreck, with little chance to save the lives of those on board, for she could not escape being swept upon the rubble mound breakwater. No life-saving crew could reach a vessel in that vicinity during any such storm, and a storm is not the only circumstance which might cause a vessel to miss the entry; this may arise from various reasons, such as fog, snow, a sudden heavy rain, or any phenomenon that makes sight or hearing difficult, beside the contingencies of loss of rudder or impairment of steering gear. The writer has personally witnessed large freight steamers, in broad daylight and in full working order, become suddenly uncontrollable upon striking the heavy adverse currents and high seas produced thereby at the Duluth entrance, and in this emergency they are always in danger of being thrown broadside against the entry piers. Any boat missing and passing such entrance at the proposed rubble mound breakwater (ending in about 30 ft. of water) would at once be pounding on the bottom and beyond all control.

To succeed in entering against a heavy adverse current, any navigator would necessarily approach under full headway; should he miss the entrance thus, he would be surely drawn onto one of the rubble mounds. If, on the other hand, the current were running in, he would then incur the risk of being carried by it against some other boat or structure in the harbor. To properly appreciate the danger of these currents, it must be understood that the mariner can not tell in advance which way the current is running.

7. The fact that preparations are already being made to carry out this work is recognized, and also that a better time to have illustrated these phases would have been at its inception; but the writer was prevented by conditions for which he was not responsible, and this is his first opportunity to present the matter in this light.

The points herein raised can not be successfully controverted, and there is probably no one who has contemplated the subject in the light of the conditions described without sharing the views which I have, perhaps feebly, attempted to express. Everyone at all interested certainly wishes to see success grow out of the very generous effort of congress and the engineering department to make safe the entrance to one of the greatest harbors in the world. Your commitee will of course desire the appropriation for this improvement to be so expended as to accomplish the purpose for which it was intended. The engineer corps is always ready to recognize a valuable fact and improvement, especially where human lives and important property interests can be better protected. The people of Superior and Duluth, who have urged the safeguarding of this harbor entrance, should be the first to recognize the value of the suggestions herein modestly offered, for the fulfillment of the present plans can only end disastrously and discourage further efforts to protect their commercial and property interests, and the lake carriers and vessel men would naturally welcome a solution of the vexed question which has made their undertakings at this harbor more than ordinarily perilous. In fact, the writer does not feel that he owes apology or risks criticism hereby, except for the long silence, which circumstances have rendered imperative, as hereinabove explained.

To avoid any possible misunderstanding, I wish to say that it is not the purpose of this communication to in any way criticise the government engineers or anyone else, and that as a government contractor I have for several years had dealings with the United States engineer corps through its Duluth representatives, and have but the highest regard and admiration for the integrity of its officers and men.

Attached hereto is a sketch of the plan proposed by me for a breakwater at the Superior entry to the Duluth-Superior harbor, and I am very certain that a consideration of its merits will compel the conviction that it meets all the requirements (1) by spreading and eliminating any approaching sea; (2) by providing an entrance without any adverse currents; (3) by permitting a boat to approach under check and "feel its way in" during heavy weather; (4) by furnishing two additional safe entrances for an emergency; (5) by creating a stilling basin; (6) by enabling vessels to pass through the inner entrance under reduced speed, and (7) accomplishing all this without producing such currents as would reach the shore and cut through the "points."

By reference to the tracing it will be observed that my plan consists of a breakwater constructed in two separate sections, placed substantially at right angles to each other, with a space or opening between these two sections, the whole placed at a suitable distance from the permanent entry to the harbor.

Thus it will be seen the currents (which would be both caused and accentuated by the plan heretofore adopted) would be either prevented or entirely eliminated in the deep water between the breakwater and the harbor entry by the method herein recommended. There would be no current at this breakwater entry, and the waves would be so spread and reduced as to create a comparative calm within the protecting arms of the breakwater. The fact of this breakwater being at a distance from the other structures and not connected with the shores would allow free play of the forces which now cause currents from the interior of the harbor outward (confined and concentrated by the present plan), so that they would be comparatively inert and unnoticeable. The entering boat could then sail directly through the outer opening, at either under check or full speed, as desired; and if for any reason this gateway is missed the vessel could be safely and conveniently steered to either side of the breakwater and come about in the calm water at its further end, this system affording three safe means of access to shelter instead of the one rather precarious entrance about to be provided. This entrance having no adverse currents, boats can safely approach it under check and "feel their way in" whenever for any reason the entrance could not be clearly seen. The value and importance of

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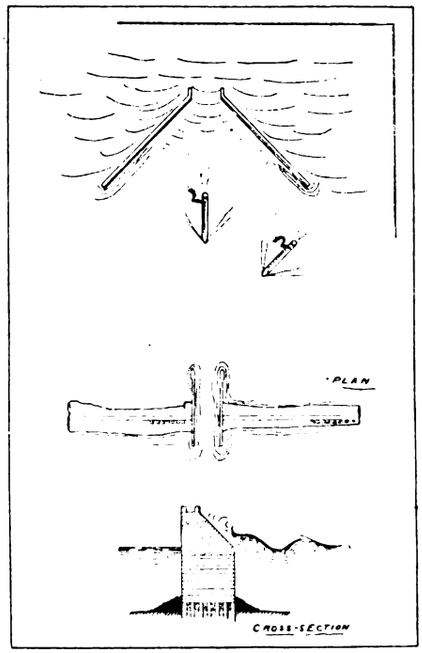
this will be readily understood and appreciated by all navigators. The same principles of construction and location would prevent the undertow, heretofore referred to, from reaching and cutting away the adjacent shores.

The use of a smooth concrete structure placed on a submerged mound of some inexpensive material is very much preferable to a rubble mound, for, while the danger of striking such a breakwater as my plan contemplates is reduced to a minimum, a rubble mound would contain much greater element of danger. The reason for this is that a boat striking the rubble mound would be carried up onto it and so securely held as to make its rescue hopeless. On the other hand, with a smooth wall structure, the rush of water would be parallel to the breakwater and in the same direction as the course of the vesel instead of over the structure, which would materially



aid the incoming boat to veer to either side and come through one of the other entrances. And should a vessel even strike such a smooth structure the probability is that her damage would be slight, as has been the case in numerous instances in the treacherous currents of the Duluth ship canal.

The plan herein recommended would enable tugs, wrecking outfits, and even the life-saving crew to go to the aid of vessels in distress, which would be impossible under the other method. At the Duluth entry this difficulty was emphasized in November of 1905, when the ill-fated Mataafa was wrecked and nine men lost within a few hundred feet from the shore and but 100 ft. from a pier. The term "life-savers" was a misnomer then, and always will be wherever such conditions exist.

In the matter of cost, it may be asserted that my proposition would entail greater expense and difficulty on account of its construction in deeper water. This, however, is not the case, in my opinion, as much less linear dimension would be required and a great deal of the work now proposed would be obviated. At all events, only loss and failure can attend the experiment now contemplated, while the improvements which I have herein outlined would prove permanent and effective, and would forever demonstrate the fact that there is a remedy for the difficulties which have confronted engineers and navigators ever since the Duluth-Superior harbor achieved its first importance.

MARE ISLAND AS A WORK-SHOP.

Editor MARINE REVIEW: Sir—In your edition of March 26, 1908, you printed a letter from George H. Corliss which might create a faulty impression in the minds of your readers.

I came to Mare Island navy yard from Quincy, Mass., last October. Every promise made to me or any mechanic of my acquaintance has been fulfilled. I know of but one man who came from the east in response to letters or advertisements who has been laid off and he was re-employed the following day. Only two men have had their ratings reduced and they for causes which would have caused their discharge in any eastern yard.

In regard to the lay off of 54 men on Dec. 5—during the time that the transport Sheridan was in the dry dock every man who applied was employed, as a necessary result many incompetent men were secured. Naturally when the rush was over they were weeded out; not a mechanic was laid off who was competent to do the work in his line.

The only plate planer who came here from the east came from Quincy where he received 30 5/9c per hour; here he received 47c per hour.

First class ship fitters receive 52c per hour; riveters, chippers and calkers, 49c, and drillers, 40c per hour on day work. Men are paid for all holidays and receive 15 days' leave a year with pay after a year's employment. In how many eastern ship yards do piece workers average as much?

The only ship fitter who came here direct from Quincy was W. B. Furman, and he has been on piece work continually and has averaged 95 3/10c per hour for the whole time; others have done nearly as well.

In regard to the cost of living, I am renting a house here for $20 per month, equal to the one I paid $25 for in Quincy. Meat does not cost over 50 per cent what it does in Quincy. For example, loin lamb chops cost 15c per lb. in Vallejo, while in Quincy they cost 35c; sirloin steak costs 12½c here, 30c there. Vegetables are not over 35 per cent as high here as there; other groceries cost about the same; electric light costs 20c per kilo in Quincy, 10c in Vallejo; coal costs $16 per ton here, but you require only a fraction of the amount; I burned $68 worth of coal and wood in Quincy during the winter of 06-07; last winter I used $18.75 worth.

In regard to losing time on account of the weather, only eight days have men been sent home on account of rain on the collier Prometheus since last October, which comprises all the lost time for this year. I admit this has been an extremely dry "wet season," but to claim that climatic conditions here are not far superior to any other ship building center in the world shows a lack of correct information on the part of the writer.

There are men out of employment in San Francisco, as in every large city in the country, but at the present time there is not a ship fitter, toolmaker, shipsmith, ship fitter's helper, painter's helper, coppersmith's helper, plumber's helper, molder's helper, holder-on, or boy on the employment register, and men are being taken on as fast as they register.

Any statement in this letter can be verified by reference to the navy department, Washington, D. C.

Yours truly,

JOHN E. MERRIAM,
Quartermaster Ship Fitter,
In charge collier Prometheus.
Vallejo, Cal., April 15, 1908.

The Navesink, the suction dredge building by the Maryland Steel Co. for the United States government, was launched recently at Sparrow's Point, Md., and was christened by Miss Margaret Tenney, daughter of Frank Tenney, of Philadelphia, president of the Pennsylvania Steel Co. The Navesink is 290 ft. in length over all, 274 ft. between perpendiculars and 47 ft. 6 in. beam molded. There are two propelling engines and four Scotch boilers. The dredging machinery consists of two 28-in. suction pumps driven by two compound engines.

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April 30, 1908.

A VICTORY FOR AMERICAN SHIPPING.

Besides the Gallinger ocean mail bill, the United States senate has passed at the present session another measure for the upbuilding of the American merchant marine. It is senate joint resolution 40, introduced by Hon. William P. Frye, of Maine, chairman of the committee on commerce. This provides that none but vessels of the United States or American vessels owned or chartered by the United States or the Panama Railroad Steamship Co. shall be used hereafter to transport from this country the supplies and equipment designed for use in the construction of the Panama canal, unless it happens that the rates asked by these American vessels are extortionate or unreasonable. The resolution also authorizes the Panama Railroad Steamship Co. to buy or charter American steamships for any needed extension of its present service to the canal zone. At present nearly all of the materials required for use at Panama are being shipped in foreign bottoms. European ship owners, realizing the future value of the Panama canal, are bending every effort to get thoroughly entrenched in the trade of the Isthmus and adjacent regions, so that when the canal is completed by the expenditure of three or four hundred million dollars of American money they may be able to turn it to the advantage of European maritime and commercial interests.

Two of the European steamship corporations which are striving already to keep this canal trade for themselves are the Royal Mail Steam Packet Co. of England and the Hamburg-American Steamship Co. of Germany. Another subsidized European concern, the Union Castle line of England, has lately had one of its spare steamships, the Dunottar Castle, of the British Royal Naval Reserve, under charter to the Panama Railroad Steamship Co. for service between New York and Colon.

President Roosevelt and Secretary Taft desire to supplant these foreign ships as fast as possible by American vessels, so that a large amount of American tonnage will be available in the Caribbean and Pacific for the expansion of American trade as soon as the great waterway is open. This joint resolution 40 has the earnest support of the national administration. It passed the senate without one negative vote. But the rich and powerful foreign steamship corporations, realizing how much it would mean to them and to the manufacturers of Europe if they were able to control the tonnage using the canal, have waged a sharp and systematic campaign against the resolution in the house of representatives. They have induced the ship brokers of New York and other maritime cities to write to manufacturers, especially in the middle west, representing that if the carrying of supplies and materials to the Panama canal were reserved to American vessels there would be no way of getting these supplies and materials out to the canal zone, because no suitable American vessels were available. In some cases these selfish and unscrupulous foreign ship owners have succeeded in frightening American manufacturers, who have written to their congressmen protesting against this legislation for the protection of American shipping. But in a great many other cases the manufacturers, suspecting the real motive behind the letters to them, have refused to become the tools of foreign monopoly.

There are 16 members of the house committee on interstate and foreign commerce—12 Republicans and six Democrats. One Republican, Hon. William P. Hepburn, of Iowa, chairman, and one Democrat, Hon. Robert C. Davey, of Louisiana, have been absent because of illness. There were 16 members of the committee present on Saturday, April 25, when the joint resolution was brought up for final action. Nine of these members, all Republicans, voted for the resolution, as follows:

Hon. James S. Sherman, New York, acting chairman.

Hon. Irving P. Wanger, Pennsylvania.

Hon. William C. Lovering, Massachusetts.

Hon. Frederick C. Stevens, Minnesota.

Hon. John J. Esch, Wisconsin.

Hon. Francis W. Cushman, Washington.

Hon. James Kennedy, Ohio.

Hon. Joseph R. Knowland, California.

Hon. William P. Hubbard, West Virginia.

Seven members of the committee voted against the resolution, as follows:

Hon. James R. Mann, Illinois.

Hon. Charles E. Townsend, Michigan.

Hon. William C. Adamson, Georgia.

Hon. William H. Ryan, New York.

Hon. William Richardson, Alabama.

Hon. Charles L. Bartlett, Georgia.

Hon. Gordon Russell, Texas.

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Two of the seven men who voted against protecting American shipping are middle western representatives, Mr. Mann, of Illinois, and Mr. Townsend, of Michigan. Two years ago congress adopted a similar resolution, providing that the supplies and equipment for use in constructing the Panama canal should be bought in the United States, unless the prices asked were extortionate and unreasonable. It is understood that both Mr. Mann and Mr. Townsend voted for this resolution to protect the interests of the manufacturers and farmers of their states in the construction of the Panama canal. Why these gentlemen should be protectionists for their own constituents and free traders toward the ship owners, ship builders and seamen of the Atlantic and Pacific coasts is difficult to answer.

TRIAL TRIP OF CITY OF CLEVELAND.

The new passenger steamer City of Cleveland, of the Detroit and Cleveland line, left the Orleans street yard of the Detroit Ship Building Co. on Monday of this week to try out her machinery. This steamer is so big and powerful that it was practically impossible to give her a dock trial, deep water and ample space being absolutely necessary. The steamer was therefore taken on an all-day run to Long Point, returning to Detroit on Tuesday. The particulars of this trial will be published in the MARINE REVIEW next week.

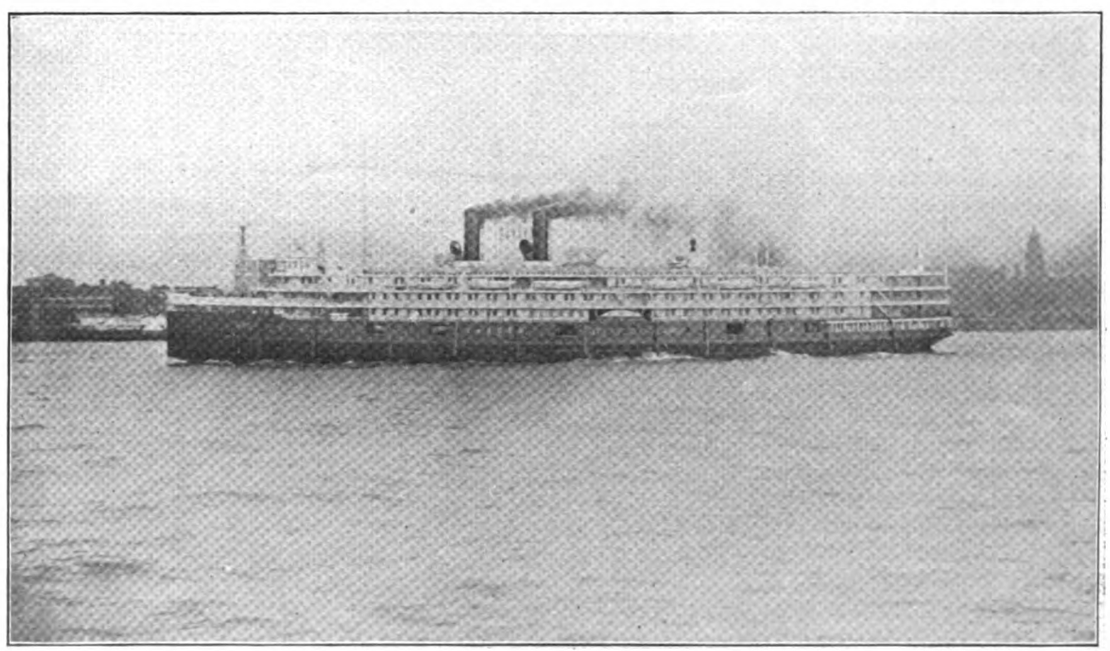
It is sufficient to say here that the steamer met every expectation, easily exceeding her contract speed of 20 miles. There were nearly 200 guests aboard, men prominent in naval architecture and marine engineering. The builders were represented by Robert Logan, general manager of the American Ship Building Co., Robert Wallace, R. B. Wallace, J. L. Wallace, Frank Jeffrey and Mr. LaMarche. The owners were represented by Frank E. Kirby and J. P. Wells, consulting engineer of the Detroit & Cleveland and Detroit & Buffalo fleets. In every particular the new steamer behaved magnificently though it blew half a gale during the entire trip.

Her auxiliaries were also given a most exhaustive try-out. On the way back when above Colchester Reef the Akers emergency gear was thrown in and the ship caused to be turned around in every direction in a big sea and gale of wind. She was then taken back to her dock at Detroit with the Akers gear. The change from the regular gear to the Akers gear was made in 12 seconds and its operation was highly commended by those competent to speak about it. This new ship when she goes on her route will be a revelation to the lake trade. She is as great an advance over any passenger steamer now on the lakes as the Lusitania and Mauretania are over any Atlantic liner.

PIG IRON SITUATION.

With No. 2 foundry iron running at $14.50 to $14.75 in the Mahoning valley, a crisis in the pig iron market is imminent. Owing to the general circulation of reports that powerful interests are in favor of adopting a new schedule based on $10, Birmingham, which would result in selling pig iron in many parts of the country at less than cost, only such buyers as have immediate needs are coming into the market. Keen interest is manifested in meetings of pig iron makers to be held next week and later in the month. There is a possibility that harmony may be brought about through the medium of an important proposition now being considered. The more active products of a month ago, tin plate, wire, sheets and merchant pipe, are still active, but no gains have been made in billets and bars; structural material and rails are a trifle improved, while highly finished commodities are more affected by the depression. The market in coke is no firmer, and some foundry coke on the track is taken below $2, but on standard Connellsville coke, the principal producers are holding at $2.15 to $2.40, ovens.

The Sault Ste. Marie canals opened on April 24 and for the first time in the history of the canal no American boat was waiting to pass through. The Canadian steamers City of Montreal and Winona successfully negotiated the rivers and were locked through. Six more Canadian boats locked through on the following day.



NEW PASSENGER STEAMER CITY OF CLEVELAND LEAVING FOR HER TRIAL TRIP.

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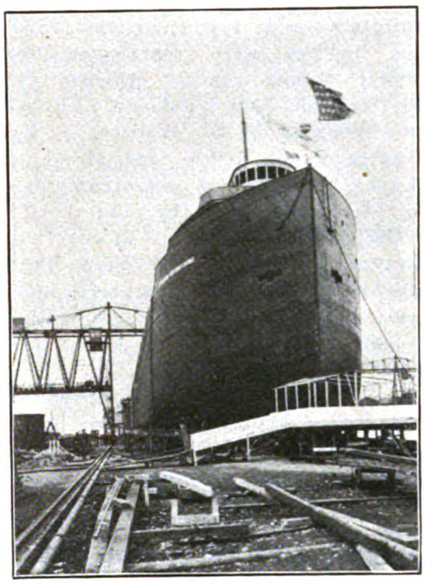
LAUNCHING THE WILLIAM LIVINGSTONE

The launching of the steamer Wm. Livingstone, named after the president of the Lake Carriers' Association, from the Ecorse yard of the Great Lakes Engineering Works on Saturday last was an event of unusual importance, and was made the occasion of doing signal honor to Mr. Livingstone. The steamer Pleasure, chartered by the ship building company, carried 2,000 guests to the ship yard, and in the evening a dinner was given by the ship building company to Mr. Livingstone and a distinguished gathering at the Hotel Pontchartrain.

The steamer was launched promptly at three o'clock and was named by Mrs. Livingstone in honor of her husband. Probably the most interested person at the launching was D. H. Cox, of New York, assistant secretary of the Society of Naval Architects and Marine Engineers. It was the first time that he had ever seen a side launching, and its simplicity and apparent freedom from strain were very impressive to him.

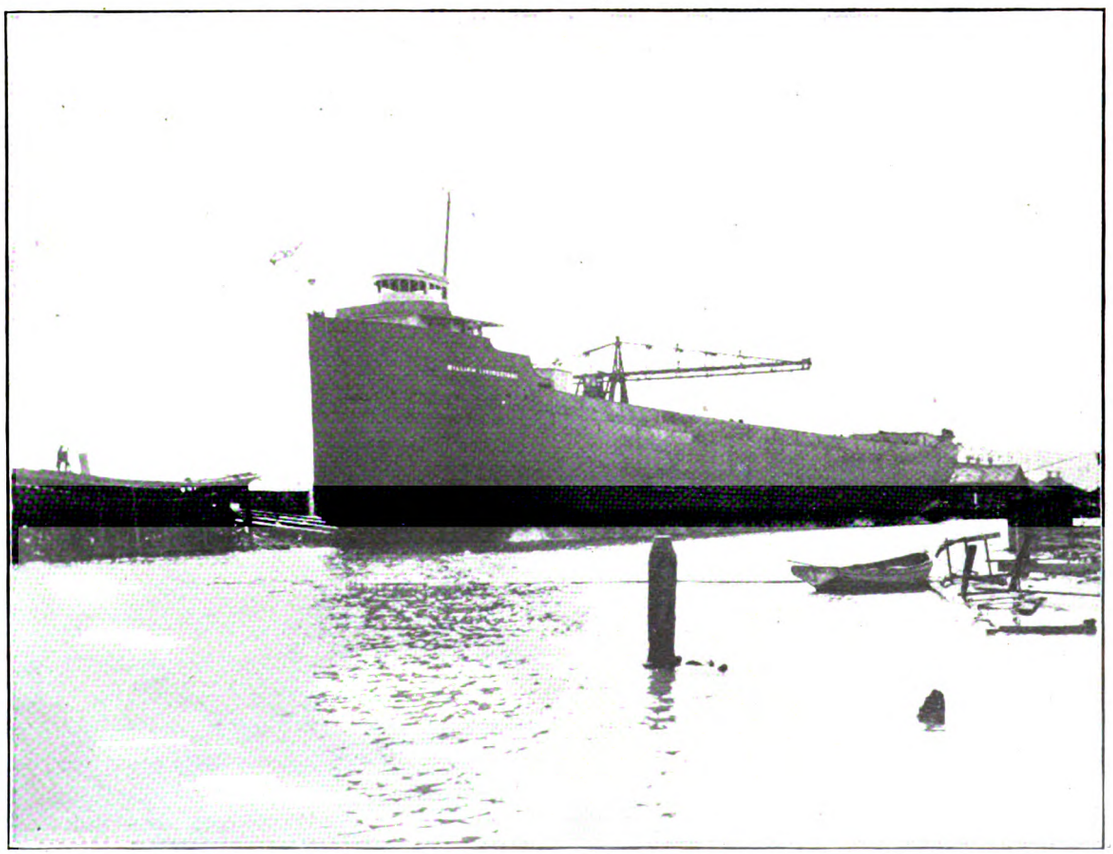
The steamer is building for the Mutual Steamship Co. of Duluth of which G. A. Tomlinson is manager. She is 557 ft. over all, 532 ft. keel, 58 ft. beam and 31 ft. deep. She has 30 hatches spaced 12 ft. centers. Her engines are triple-expansion with cylinders 24, 38 and 65 in. diameters by 42-in. stroke, supplied with steam from Scotch boilers, 16 ft. by 11 ft. 6 in., equipped with Great Lakes heated draft and allowed a working pressure of 180 lbs. She will carry 10,500 gross tons of ore.



THE LIVINGSTONE ON THE WAYS.

The dinner was marked by that same carefulness of detail that characterizes all of the functions of the Great Lakes Engineering Works. The menu card was beautifully printed and included a full page steel engraving of Mr. Livingstone with his autograph. Mr. Livingstone's menu card was personally signed by everyone present, making an unusual souvenir. The speaker's table was decorated with a model of the steamer Livingstone in flowers. It was 5 ft. long and worked out in exact proportion. The sides of the ship were formed of red carnations, the deck being white with hatches red. The deck houses were of white. The red and green side lights were burning with the usual lights on the spars. The union jack was flying forward, the stars and stripes on the stern, the name flag on the main mast and the fleet pennant aft.

Before the speech-making began, at



JUST AS SHE STRUCK THE WATER—NOTE HOW EVEN THE WAVE LINE IS, SHOWING A PERFECT LAUNCHING.

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the suggestion of Mr. Coulby, a toast standing was drunk to Mr. Livingstone.

Antonio C. Pessano, president and general manager of the Great Lakes Engineering Works, in introducing Mr. Tomlinson recounted his early days in Detroit when, as a lad, he landed in that town from Wyoming looking for work. He considered it fortunate both for the employe and employer that he found work on one of Mr. Livingstone's enterprises. It was therefore fitting that having acquired a large fleet of vessels he should name one of them after his first employer. Mr. Pessano stated that letters had been received from cabinet members, governors and United States senators deeply regretting their inability to be present.

In responding Mr. Tomlinson said that when he left Detroit 15 years ago, Mr. Livingstone was the political Pooh-Bah from Grosse Point to the Ecorses and that apparently no change had taken place in his status since. He added that he went to work on the *Evening Journal* 22 years ago and had been continuously grateful to Mr. Livingstone ever since. Mr. Livingstone gave him a job at $6 a week and he named a boat in his honor because Mr. Livingstone paid him more than he was worth.

Mr. Pessano stated that there were two important days in the life of a ship builder, the day that he signed the contract for the ship and the day he launched her. He wanted no other duty and therefore turned the proceedings over to Harvey D. Goulder as toastmaster.

Mr. Goulder requested J. H. Sheadle, vice president of the Lake Carriers' Association, to speak in behalf of the association. Mr. Sheadle said that

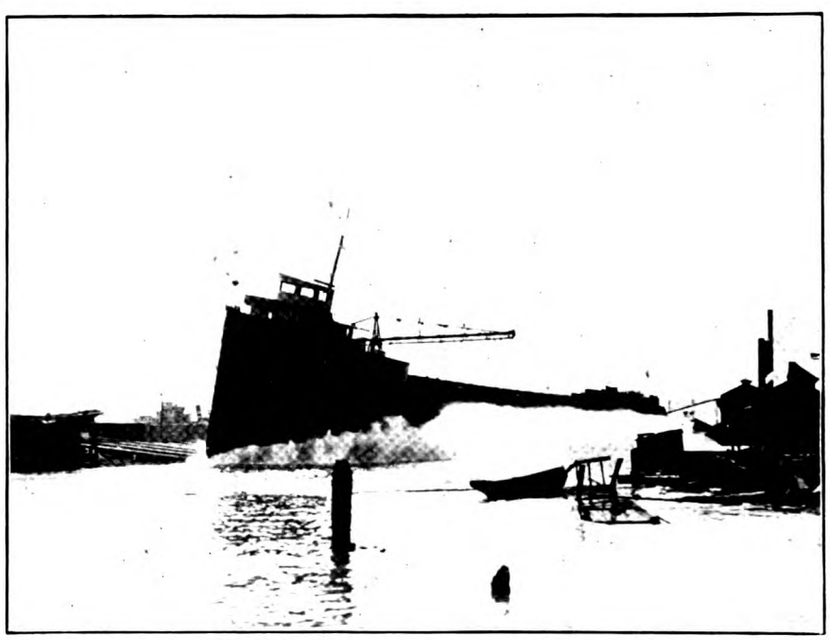
PRESIDENT AND MRS. WILLIAM LIVINGSTONE.

when Mr. Tomlinson came to Detroit with a bundle of bonds under his arm and exchanged them for a ship he did a handsome thing in naming the ship William Livingstone. He said that the Lake Carriers' Association had grown very fond of the "Old Man," which was their affectionate term for him. Mr. Sheadle considered the Lake Carriers' Association to occupy a most unique position in that with the exception of the Steel Corporation it is the largest employer of labor in the United States. The presidency of the association is a distinguished office, Mr. Sheadle saying that there never had been Mr. Livingstone's equal in the position and they never expected to discover anyone equal to him. Mr. Sheadle said the ship had been builded well but all hoped that Mr. Livingstone would survive her.

George H. Russel was asked to respond to the toast "The Banks of Detroit," but felt that there was little to say upon that subject save that they had been very busy since the financial panic of last October and expected to be busy for some time. He confessed that a thrill went through him as he saw the fine boat launched. "I confess," said he, "that when the patient, gentle, tender, loving, long-forgiving wife broke the bottle on the head of her husband, it touched me. I did not quite hear what she said but I understood it to be 'Now, will you be good, Willie?' If it is a reform we have done a good work today. This ship bears his name but is not designed after him, for no one can say of Wm. Livingstone that he is deep of hold and broad of beam, but to finish the simile we might say that we have seen him when he had great carrying capacity. But to be serious, we know Wm. Livingstone and we all love him for his humanity and I can do no better than to repeat the hope of Mr. Sheadle, 'We have builded her well and for a time, but we hope our good friend will outlast her.'"

Col. Townsend, government engineer, spoke briefly on the general merchant marine situation, saying that the United States had a greater merchant marine than any two countries except Great Britain, all of it, however, with the exception of 800,000 tons, being in internal trade. He related an experience which he had had as an officer in the Philippines in endeavoring to get cement to the islands from the United States. Nearly all cement used comes from China and Japan but was of such inferior quality that he desired to get American cement. He found, however, that the foreign steamship companies so manipulated freight rates as to make competition between European and American cement impossible.

Judge Whelan, collector of customs, said that he had succeeded Mr. Livingstone as collector but did not hope to succeed him in his more important offices of vessel owner and banker.



THE ROLL TO PORT AS SHE LEAVES THE WAYS.

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He made a plea for a government motorboat on the Detroit river to regulate the movements of that growing class of craft.

Mr. Goulder said that so large an institution as the Great Lakes Engineering Works must have branches and he called upon J. C. Wallace to speak. Mr. Wallace quite agreed with the toastmaster and said that it was something he was looking forward to with a great deal of interest. He was

THE REVERSE ROLL TO STARBOARD.

sorry not to have built the Wm. Livingstone but did not think any ship building company could improve upon her construction. Certainly her launching could not have been more satisfactory. He felt that Mr. Pessano would agree with him that the ship builders of the lakes do not want any more ships to build upon the same terms and prices as have ruled during the past two or three years. This caused ship owners present to smile, but Mr. Wallace maintained that when industry revived ships could not be procured as cheaply in the future. He regarded the dull time as a good thing and thought that everyone must take it as best they can.

Thomas F. Cole, of Duluth, spoke quite impressively. He had but recently returned from the Sierra Madeiras whither he went on a mining expedition. They penetrated the region 110 miles beyond the railway, crossing many ranges and seemingly exploring virgin territory. Then when they thought they had penetrated where no man had ever been before they looked down from the summit upon which they stood and gazed at a little village nestling in the foothills. This little village was more than a century old and marked the spot where four men had located. Mr. Cole took occasion then to pay a tribute to the Spaniards who first opened up this country. He felt that the Spaniards of that day were a wonderful race of men. Mere handfuls of them, say 10 or 12, would penetrate for hundreds of miles into the heart of a country completely surrounded by hostile tribes. The first thought would be that they would all be killed, but on the contrary they were welcomed by the natives. They were welcomed because they taught the natives how to do things, how to win the metals, how to wrest the secrets from nature, and how to take advantage of the conditions surrounding them. And so Mr. Cole said it was throughout life. The man that can do things, the leader, is welcomed.

A witty speech, one not susceptible to translation on paper, was made by Henry Russel. It was a speech filled with banter but nevertheless he took occasion to pay a very fine tribute to Mr. Livingstone.

Harry Coulby said that his acquaintanceship with Mr. Livingstone was so close that it seemed a little out of place for him to speak at all. "We have not gathered here," said Mr. Coulby, "to honor him as a banker. That is not necessary; nor as a philanthropist, for philanthropy is often done as a penance; nor as a statistician, nor as a journalist. We are here because he is a man for a' that. There are many men who give of their money, but Wm. Livingstone gives of himself. The measure of the man is not what he accumulates but what he does. It is his work that has made it possible to move the mighty commerce of the lakes. He is frequently called 'Sailor Bill.' Lincoln was called the 'Rail Splitter,' but both are terms of affection. We honor him for where he started from. Everyone feels the impetus of his life work. Of all the men that I have ever known he comes the nearest to following that divine command, 'Whatsoever thy hand findeth to do, do it with all thy might.'"

Mr. Goulder felt that the occasion would not be complete without a few words from the chief shipping commissioner, A. R. Rumsey, who has been associated with the lake carriers ever since it became an organization.

"I had it in mind to say," said Mr. Rumsey, "all that was in my heart, but I shall only say that, strong as Mr. Livingstone is, I think you would have done him proud. I could not add a single thing to what has been said, and I can only hope that some day I may be treated as well."

Brief speeches were made by Justice Moore, of the supreme court of Michigan, Capt. D. Sullivan, of Chicago, Capt. J. J. H. Brown, of Buffalo, and J. C. Hutchins, of Detroit.

Mr. Goulder then introduced the guest of the evening in splendid style.

Mr. Livingstone's remarks were quite affecting. He felt that he was blessed with friends more than he deserved and he hoped to merit their commendation. Touching upon the serious side of life and Mr. Tomlinson's extraordinary success he felt that it was an exemplification of opportunity. It is a mistake to suppose that the chances are fewer now. They are in fact greater and more numerous. He pointed to the fact that five years ago the place where the steamer Wm. Livingstone was launched was only a swamp, but that in five brief years upon that marsh land a great ship building plant had been erected and 45 vessels put into the water.

It was nearly midnight when the speech-making came to an end. Those present were: Mr. and Mrs. J. C. Wallace, Harry Coulby, Harvey D. Goulder, J. H. Sheadle, A. J. Gilchrist, J. A. Gilchrist, W. B. Davock, W. C. Richardson, W. G. McGean, W. A. Hawgood, J. H. Mulrooney, George Marr, A. R. Rumsey, E. P. Lenihan and J. B. Ayers, from Cleveland; Mr. and Mrs. J. J. H. Brown, T. T. Morford and E. T. Douglass, from Buffalo; C. B. Calder, H. I. Shepherd and Wm. Hardee, from Toledo; Mr. and Mrs. D. Sullivan, and F. G. Hartwell, from Chicago; Mr. and Mrs. G. Ashley Tomlinson, Thomas F. Cole and F. A. Patrick, from Duluth; H. S. Wilkinson, from Syracuse, and W. A. Prime and D. H. Cox, from New York; Mr. and Mrs. James E. Davidson, Capt. James Davidson, C. R. Wells and Mrs. Carman Smith, from Bay City; Mr. and Mrs. LaMarche, from Lorain; Prof. J. W. Mauck, from Hillsdale, Mich.; Hon. Joseph B. Moore, from Lansing, Mich.; H. C. Sadler, from Ann Arbor, Mich.; Mr.

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and Mrs. Wm. Livingstone, the Misses Livingstone, W. A. Livingstone, Mr. and Mrs. E. W. Cottrell, Mr. and Mrs. J. C. Hutchins, Mr. and Mrs. A. A. Schantz, Mr. and Mrs. A. C. Pessano, Mr. and Mrs. H. W. Hoyt, Mr. and Mrs. H. C. Potter, George H. Russel, Emory W. Clark, John T. Rich, Gen. G. J. Lydecker, Col. C. McD. Townsend, Major Charles Keller, John B. Whelan, C. H. Westcott, J. W. Westcott, H. K. Oakes, Walter S. Russel, John R. Russel, Howard Lesher, C. F. Bielman, B. W. Parker, R. T. Gray, L. C. Waldo and L. H. Jones, of Detroit.

LAKE SITUATION.

Vessel owners will meet in Cleveland on May 12 to determine when navigation shall open. It was decided at a meeting held some time ago that navigation should not open until May 12, but it is quite probable when the meeting convenes on May 12 that the opening will be again postponed. It is true that a few boats have left port, but these were under special charters made prior to the general agreement and in no way violate it. One vessel is taking up coal and three or four are bringing down grain, but after delivering their cargoes it will be some time before they leave port again.

Vessel owners and shippers alike are looking dubiously at the future. The ore trade is of course the dominant trade of the lakes and ore is at present a drug on the market. Some of the leading shippers have not sold a pound of ore for 1908 delivery and consequently are manifesting very little interest in their vessel property. In fact, as far as known, only 50,000 tons of ore have been sold so far this year, whereas at this time last year the whole season's movement had been contracted for. One of them stated this week that he did not think there would be occasion to move vessels until June. Figures of ore on dock will be compiled next week and in all probability will show heavier stocks than ever before, but figures of ore on dock this year lose their significance, for furnace piles are doubtless bigger than dock piles.

The package freight lines opened their season this week. The Sault Ste. Marie canal opened on April 24 with not a single American steamer waiting to be locked through. This is the first time in its history that such a thing has occurred.

LAUNCHING THE RUFUS P. RANNEY.

The bulk freighter Rufus P. Ranney was launched at the West Superior yard of the American Ship Building Co. on Saturday last, being christened by Miss Elizabeth Ranney, of Cleveland. The Ranney is building for the Triton Steamship Co. of Cleveland and will be managed by J. R. Davock, of Cleveland. The steamer is 440 ft. over all, 420 ft. keel, 52 ft. beam and 28 ft. deep. Her engines are triple-expansion with cylinders 22, 35 and 58-in. diameters by 42-in. stroke, supplied with steam from Scotch boilers, 13 ft. 9 in. by 11 ft. 6 in., equipped with Ellis & Eaves draft and allowed a working pressure of 180 lbs. She will carry 7,500 gross tons of ore. Her hatches, 12 in number, are spaced 24-ft. centers, opening 12 ft. fore and aft.

Capt. Henry Stone will be her master and Robert C. Cummings her chief engineer. The Ranney is the second steamer of that name on the lakes. The wooden steamer R. P. Ranney of the Bradley fleet was named after Judge R. P. Ranney, grandfather of the namesake of the present boat.

STEAMER JOHN A. DONALDSON.

The launching of the steamer John A. Donaldson at the Lorain yard of the American Ship Building Co. on Saturday next will be made the occasion for a general inspection of the ship yard, which has been completely remodeled during the past two years. Those who have not seen the yard since its transformation began will not recognize it, as it has been greatly extended in area, new buildings erected and new dry dock built. The new freighter will be christened by Mrs. John A. Donaldson, in honor of her husband, who is the general agent for the Pittsburg Coal Co. on the lakes. At the conclusion of the launch luncheon will be served in the new mold loft. The Donaldson is building for the Valley Steamship Co., of which W. H. Becker, of Cleveland, is manager.

GREAT LAKES REGISTER.

The Great Lakes Register has just issued in a separate volume its rules and regulations for the building and classification of steel and wooden vessels. These rules have been thoroughly revised and brought practically up to date to fit the present method of shipbuilding on the lakes. Attention is drawn to the pink tables which have been especially prepared to cover the building of the new type of steel bulk freighters. This new type of construction embodies what is known as the arch system, side water ballast tanks, and hatches spaced 12 ft. and 24 ft. centers. Great clearness and simplicity have marked the preparation of these rules and the layman should have no difficulty in taking therefrom any information that he may require regarding the construction of a lake vessel.

AROUND THE GREAT LAKES.

Navigation on Portage lake opened on April 28 with the arrival at the ship canal of the freighter S. O. Reynolds of the Mutual Transit Co.'s fleet.

The steamer Alva with grain from Milwaukee was the first boat to reach Buffalo this season. She entered the harbor on April 25, having been helped through the ice by the tug Cascade.

The steamer W. R. Woodford, building for W. A. and A. H. Hawgood, of Cleveland, will be launched from the Bay City yard of the American Ship Building Co. on May 16.

Capt. P. H. Uberroth, of the revenue cutter Tuscarora, has received orders to prepare the Tuscarora for commission, and she may be ready for active service by May 1.

The Cleveland & Buffalo line has opened navigation between Cleveland and Buffalo. There is some ice at the foot of Lake Erie, but not enough to materially alter the running schedule.

The steamer Thomas Barlum left on her maiden trip on Tuesday of this week. With her name illumined by electricity at night she will be the most conspicuous of the bulk freighters.

The steamer John A. McGean left Cleveland on April 27 with coal to Fort William, the contract being that the cargo was to be delivered as soon as navigation in the Soo river was opened.

There will be temporary delay in the opening for the season of the new westerly Bar Point channel, at the mouth of Detroit river, during which time the buoy lights will not be exhibited.

The steamer Mary, which was recently destroyed in the big fire near Boston, was formerly a lake steamer, having been successively owned by the Graham & Morton Co. and the Michigan City line.

The Gilchrist Transportation Co. has sold the wooden schooners F. A. Georger and Twin Sisters to M. J. Galvin, of Buffalo. The Georger, which was built in 1874, is 200 ft. keel and 35 ft. beam. The Twin Sisters came out in 1889 and is 204 ft. keel and 35 ft. beam.

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SIMILAR PLANE FIGURES.

Similar plane figures are such as have the same form, namely: equal angles and their like dimensions proportional.

Similar triangles are those having the same angles, with proportional sides; in other words, a small triangle compared with a larger one, or vice versa. Since the like dimensions of similar plane figures are proportional, we are able to solve many of the problems belonging to the higher mathematics by simple proportion.

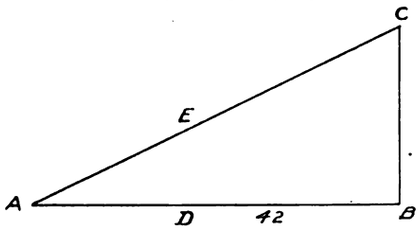


FIG. 1.

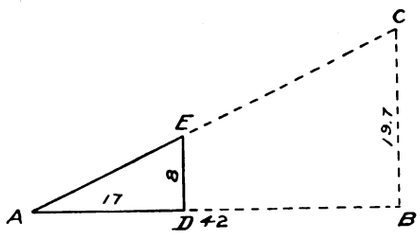


FIG. 2.

Figs. 1 and 2 will explain the similarity of triangles and the geometrical ratio between their sides. ABC, Fig. 1, is a triangle in which the side AB is 42. If at any place on the AC (at E for instance) we drop a line that will be exactly at right angles to the line AB (at D for instance), and with the measurements AD and DE and the length AB, we can by proportion, find the length of BC. Thus, AD : AB : : DE : BC; if AD = 17; AB = 42 and DE = 8; or

17 : 42 : : 8 : x and x equals 19.7,
8 [or the side BC

17)336.0(19.7
17
166
153
130
119

The triangle ADE, Fig. 2, is similar to the triangle ABC, Fig. 1, in which AD is to AB as DE is to BC.

In Fig. 3, a similar triangle, AB = 80; AD = 34 and DE = 22; what is the length of BC? AD : AB : : DE : BC; BC = 51.7, found thus:

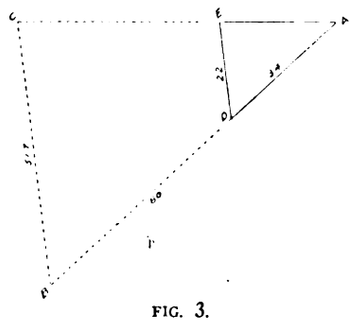


FIG. 3.

34 : 80 : : 22 : x
80

34)1760.0(51.7
170
60
34
260
238

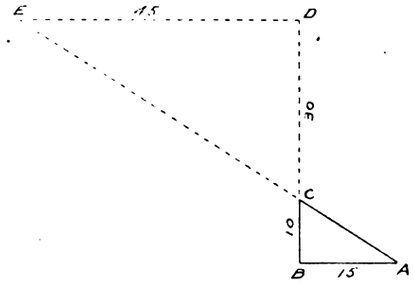


FIG. 4.

BC : CD : : AB : DE, or
10 : 30 : : 15 : x
30

10)450
45

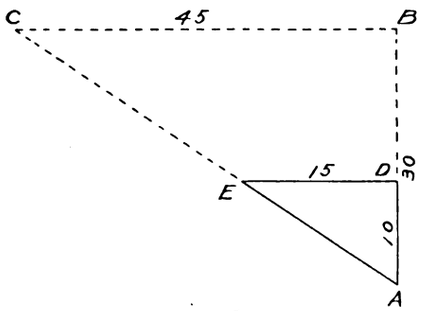


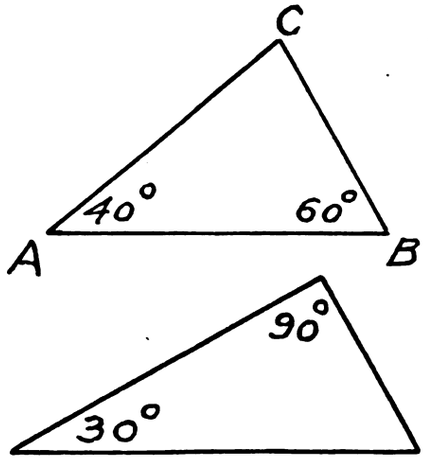
FIG. 5.

10 : 30 : : 15 : ×

TRIANGLES.

From the extremities of the line AB, draw lines that shall make angles of 60° and 40°, respectively, with AB. Prolong the lines until they meet at C, forming a triangle. Measure the angle at C. How many degrees does it contain? Answer 80°. How many degrees are there in the sum of the three angles of the triangle? Answer 180°.

Construct a triangle having one angle of 90° and one of 30°. Measure



the third angle. (60°.) How many degrees are there in the sum of the three angles?

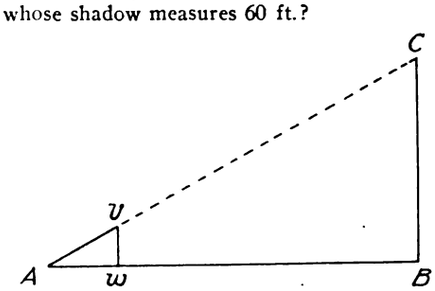
CALCULATING HEIGHTS AND DISTANCES.

To verify the results obtained by calculation, the pupil should make diagrams, drawing the figures to a convenient scale.

1. If *AB* in a right-angled triangle measures 120 ft., and a perpendicular, *vw*, erected 10 ft. from *A* measures 5 ft., calculate the length of *BC*.

Aw : *AB* :: *wv* : *BC*; *i. e.* 10 : 120 :: 5 : *BC*.

2. A post 6 ft. above ground throws a shadow of 7½ ft. How high is a tree whose shadow measures 60 ft.?



3. Wishing to ascertain the distance between two houses, *R* and *S*, on opposite sides of a stream, I measure a line, *SV*, at right angles to *SR*, 200 ft. At *T*, 90 ft. from *V*, the perpendicular *TW* measures 60 ft. Required the distance *SR*.

VT : *TW* :: *VS* : *SR* *VT* = *VS* − *ST*.

4. Beginning at *B*, 100 ft. from the bank of a river, a line, *BC*, is measured 1,200 ft. long. At *D*, distant from *C* 90 ft., the perpendicular *DE* is found to

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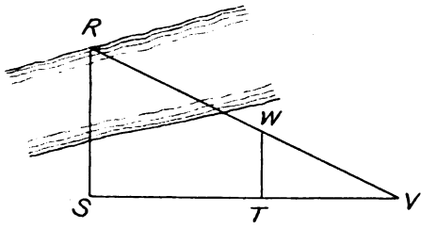
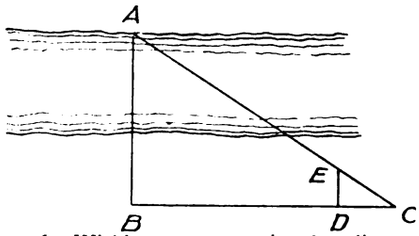
measure 50 ft. What is the distance from *B* to *A*, a tree on the opposite bank? How wide is the river?



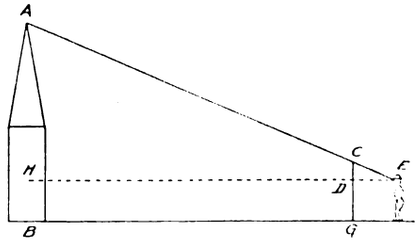
5. A boy, whose eye (*E*) is 4 ft. from the ground, can just see the top (*A*) of a steeple when he stands back 3 ft. from a fence (*CG*) 6 ft. high. The distance from the foot of the fence to the center of the base of the steeple is 177 ft. Find the height of the steeple, *AB*. *CD* = ? *EH* = ? *ED* : *CD* :: *EH* : *AH*.

When *AH* is found, how may you get *AB*?

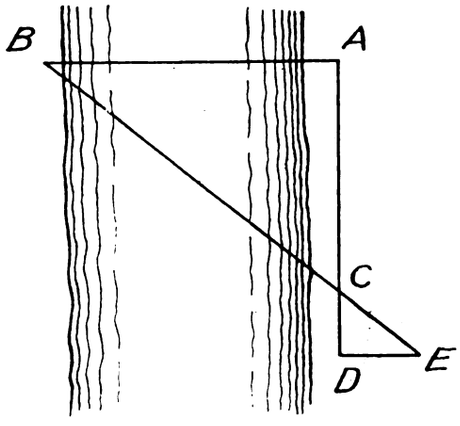


6. Wishing to ascertain the distance *AB*, I measure a line, *AD*, at right angles to *AB*, 12 chains; *DE*, at right angles to *AD*, 5 chains; and find that a line sighted from *E* to *B* intersects *AD* at *C*, distant from *D* 3.25 chains. What is the distance from *A* to *B*?

Note.—The triangles *DCE* and *ACB* are similar. Why?



7. Wishing to find the height of a tower, *fi*, I set up a pole, *cd*, 12 ft. long above the ground. Another pole, *ab*, 4½ ft. above ground, is set up at such a distance that the tops of the two poles and of the tower are in a line. The distance between the poles (*ae* or *db*) is 10½ ft. The distance from *d* to the foot of the tower is 195 ft. The width of the tower (*kj*) is 30 ft.



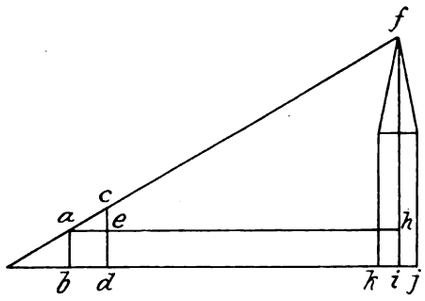
The similar triangles *aec* and *ahf* give us the proportion

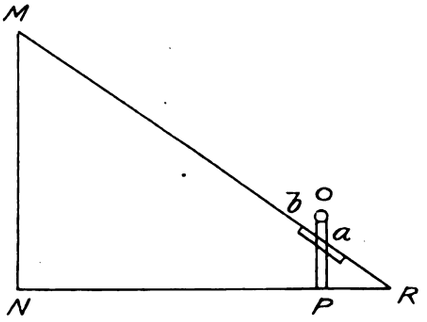
ae : *ah* :: *ec* : *hf*.

What is the distance *ec*? *ah* = *bi* = *bd* + *dk* + *ki*. *ki* = ½ *kj*. When *fh* is found, what must be added to get the height of the tower?

8. To determine the height of a building, *MN*, a person attached a straight strip of wood, *ab*, to a post, *OP*, in such a manner that sighting from *a*, he could just see *M*, the top of the building. He then sighted down from *b*, and marked on the ground the point *R*, on a line with *ab*.

PQ was found by measurement to be 4 ft., *RP* 6 ft., *PN* 120 ft. Required, *MN*.





ANSWERS.

1. Ans. 60 ft.

2. Height of tree 48 ft., found thus, 7.5 : 60 : : 6 : x = 48.

3. 133.3 ft.

4. 666.6 ft.

5 124 ft.; ED = 3 ft.; CD = 2 ft.; EH = 180 ft.; DG = 4 ft. (height of eye); ED : EH :: DC : HA, or 3 : 180 : : 2 : x = 120 + 4 = 124 ft.

6. AB equals 13.4 chains; DC : CA :: DE : AB, or ED = 5, DC = 3.25, CA = 8.75 (12 — 3.25), or DA — CD;

3.25 : 8.75 : : 5

5

3.25)43.750(13.4

325

1125

975

1500

1400

7. 90.5 ft.; since, ab = 4½ and cd = 12, ec = 7.5 (12 — 4.5); ae or bd = 10.5; dk = 195; kj = 30; ki = 15, or b + d + k + i = 220.5, or 220.5 = bi; ab or ed = 4.5 ft.; hf = 86 ft.; ab = 4.5 ft.

8. 84 ft.

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

454. 27 minutes 10 seconds.
455. 18 hours.
456. 416¼ miles.
457. 144 hours.
458. 50 miles.
459. 57.5 lbs.
460. 8.5799 lbs.
461. 287.37 miles.
462. 318.75 days.
463. 33.475 tons.
464. 1h. 18m. 17s.
465. 13h. 32m. of day and 10h. 28m. of night.

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

466. Change 8,675 minutes to days, etc.
467. How many hours and parts of an hour are 9,483 seconds?
468. Change 373 inches to yards.
469. How many hours in 2/3 of a day?
470. How many hours in 1/5 of a day?
471. What fraction of a day is 3h. 20m.?
472. Reduce 960 minutes to hours.
473. What fraction of an hour is 12 minutes 30 seconds?
474. Multiply 3h. 15m. 15s. by 5.
475. Divide 243 days 4 hours 2 minutes by 15.
476. 5° 30′ 36″ into degrees and decimal of a degree.
477. Convert 38 minutes into the decimal of an hour.

The revenue cutter Fessenden has been purchased by George L. Craig, of Toledo, who will convert her into a passenger boat for the excursion service out of Toledo. The Fessenden was built in 1884, at Buffalo, of iron. She left Lake Erie several years ago for the coast. Her original cost was $75,000. It is understood that Mr. Craig secured her for $9,000.

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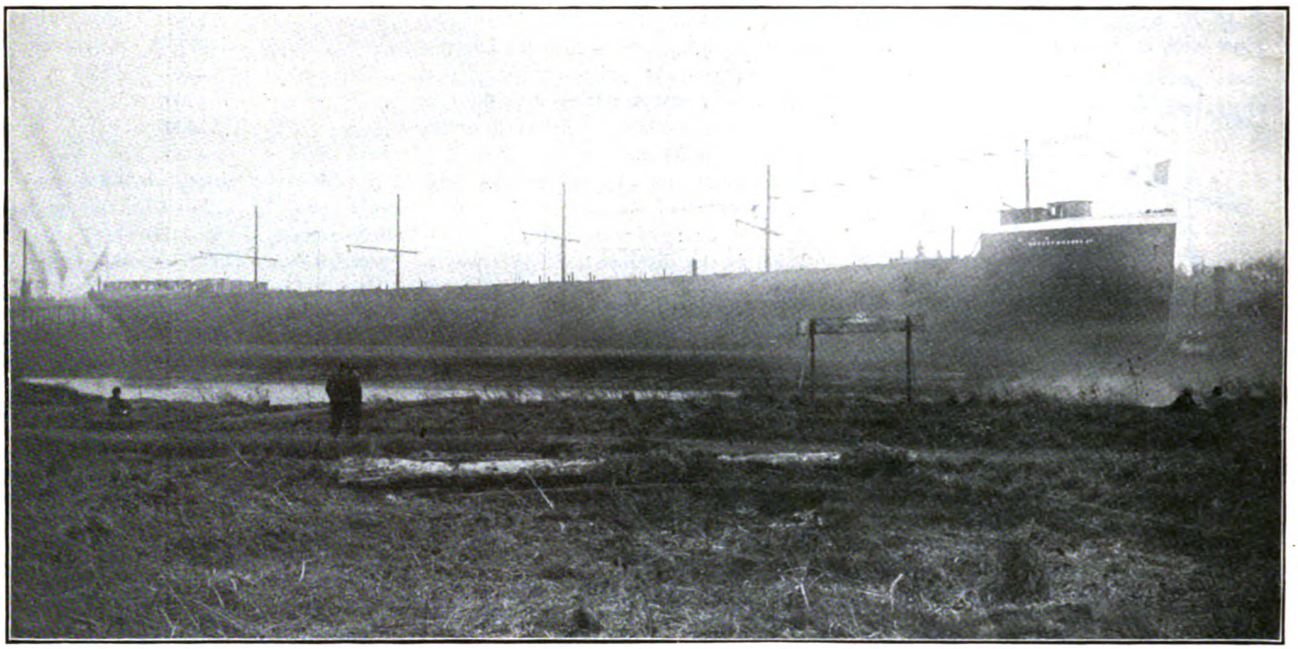

BULK FREIGHTER H. M. HANNA JR. ON THE WAYS.

FREIGHTER H. M. HANNA JR., LAUNCHED.

Capt. W. C. Richardson believes that in the Howard M. Hanna Jr. and the David Z. Norton he has the two best freighters on the lakes, and

MISS ANTOINETTE PAINE.

of these two the Hanna is a little the better. In dimensions both the steamers are alike, except that the Hanna has 2 ft. more beam, being 54 ft. wide. Both are 500 ft. long, having 14 hatches spaced 24-ft. centers with an opening of 12 ft. fore and aft. The Hanna has finer lines than any freighter on the lakes, of easy model, lean both fore and aft. Owing to her finer lines it is expected that she will be driven through the water one-half mile faster than the Norton on the same number of revolutions.

Like the Norton, the Hanna is of unusually strong construction, having, in addition to the 15 arches, 56 deck beams, each 54 ft. long, 3 in. thick and 12 in. deep. The arches weigh 8 tons each and are 5¼ ft. deep. Owing to her extra beam she will carry about 200 tons more ore than the Norton.

Many innovations have been made in the ship which Capt. Richardson's experience has proved to be wise. For instance, there are two dead lights in the fantail to give light to

CAPT. W. C. RICHARDSON.

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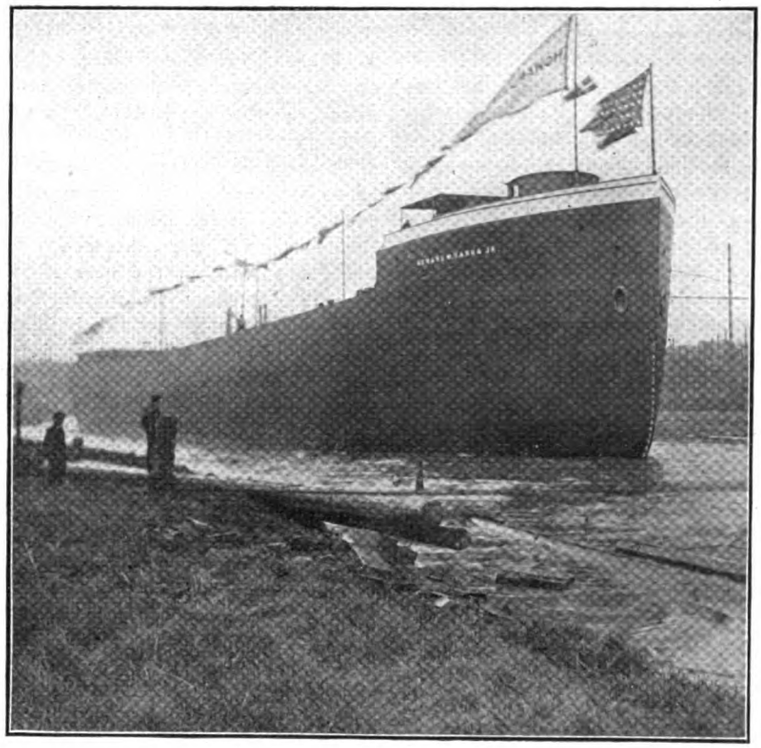


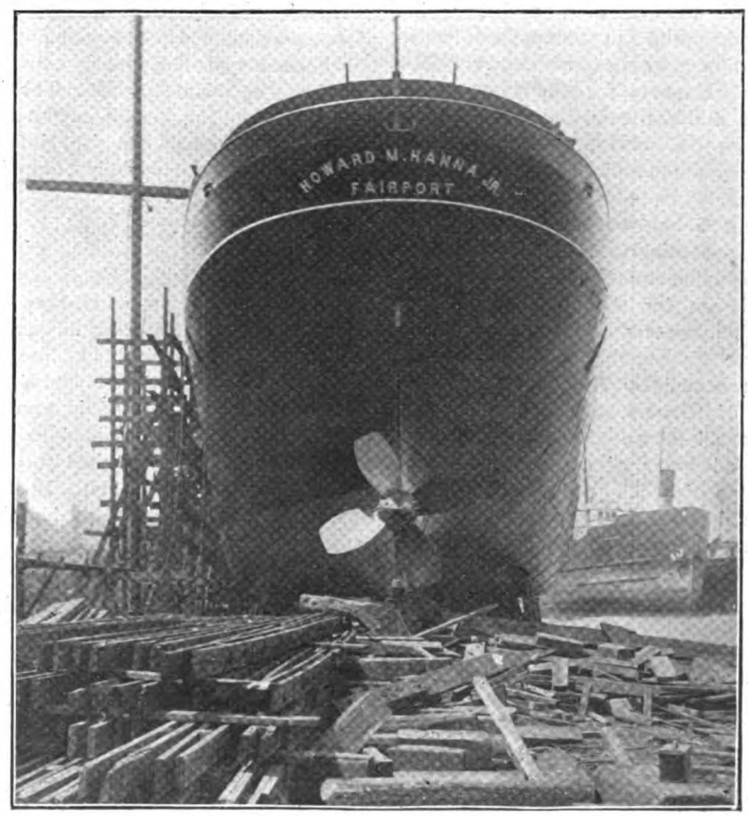
THE H. M. HANNA JR. IMMEDIATELY AFTER LAUNCHING.

the quadrant and to take away the foul air which usually cannot be got out. Her cabin arrangements follow the same general design as those in the Norton except that her decks are flush. The cabin space is divided by a 4-ft. corridor leading into the windlass room. On the starboard side of the corridor are the passengers' quarters and on the port side the crew's quarters. Water ballast is carried in side tanks as well as in the water bottom and her cargo hold is fitted with syphons. The Hanna's construction has been well thought out and she is a model of strength and convenience.

The Hanna was launched from the Cleveland yard of the American Ship Building Co. on Tuesday, April 28. She was christened by Miss Antoinette Paine, of Ashtabula, granddaughter of Capt. Richardson. As is usual at this yard, the freighter went overboard a little ahead of time, and as usual, the launching was successful in every way. Many comments were made among ship owners and ship builders present upon the vessel's attractive appearance, her lines giving her a far more graceful form than is common among lake freighters. Interested spectators were Antonio C. Pessano, president and general manager of the Great Lakes Engineering Works, and Charles B. Calder, general manager of the Toledo Ship Building Co. President Wm. Livingstone, of the Lake Carriers' Association, who was unable to be present, sent a beautiful bouquet of American Beauty roses.

Among those witnessing the launch were: W. C. Richardson, Harvey D. Goulder, James C. Wallace, Robert Wallace, D. Z. Norton, Frank Billings, W. A. Hawgood, A. H. Hawgood, J. H. Sheadle, Howard M. Hanna Jr., H. N. Herriman, Mr. and Mrs. M. Andrews, Mr. and Mrs. C. E. Grover, Miss Ruth Grover, Mr. and Mrs. J. S. Manuel, Mr. and Mrs. Clarence Richardson, Mr. and Mrs. A. J. Gilchrist, Mrs. George Harris and Miss Crossen, Mr. and Mrs. P. M. Paine, E. W. Savage, Mr. and Mrs. J. E. Savage, W. Paine, Miss Kate Paine, Thomas Cheney, Edward Large, Edward Burrell, G. E. Bucro, W. H. Morrison and David Haskell of Ashtabula, Capt. and Mrs. Thomas Wilford and Capt. J. H. Babbitt of Lorain, Mr. and Mrs. Hugh Ford of Akron, Capt. C. L. Hutchinson, W. H. McGean, W. H. Becker, W. E. Chapman, J. T. Kelley, F. B. Richards, E. C. Collins, Roy Williams, Capt. James Buchanan, Thomas McDermott, A. E. Williams, George Hausheer, C. P. Gilchrist, J. A. Gilchrist, John Donaldson, George Randerson, Capt. Edward Thorpe, Capt. John Ward, Capt. Thomas Beggs, Capt. Samuel Allen, John Thompson, R. C. Wetmore, George H. Warner and Charles McMorris, A. C. Pessano and R. T. Gray, of Detroit; J. L. Tuttle, W. Page, of Buffalo; J. C. Siegel, of Erie; John

(Continued on page 34.)



STERN VIEW OF BULK FREIGHTER H. M. HANNA JR.

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BOSTON MARINE NOTES.

Boston, April 29.—British steamer Bisley, in which the two Curtis (Fore River) turbines for the Japanese cruiser Ibuki will be shipped to Japan, arrived at the works of the Fore River Ship Building Co., Wednesday afternoon. The Bisley, which came across in water ballast, is a new steamer, this being her second cargo. She hails from London and was built by Charles Connell Co., Ltd., of Glasgow. The task of loading these two engines, which are all in sections and for the most part packed in large crates or otherwise protected with wood covering, was begun immediately. The steamer Bisley will, after leaving the works of the Fore River Ship Building Co., proceed to New York, where the balance of her cargo will be made up, consisting of railroad cars and other railroad material, after which she will start for Japan, sailing via the Suez canal.

The Japanese cruiser in which the two turbines will be installed was recently launched at the Kure naval dock yard, Japan, and on her speed trials will be expected to maintain a speed of 23 knots. Both are 144-in. seven-stage Curtis (Fore River) marine reversible steam turbines with considerable over-load capacity.

For the week ending Friday, April 17, imports for the port of Boston amounted to $1,570,247, a heavy decrease in value in comparison with those of a year ago, which were $2,376,636. Exports for the same week showed a slight gain, being $1,818,170, while for the corresponding period of 1907 they amounted to only $1,704,948.

Acting Governor Draper has signed a bill appropriating $10,000 to be used by Masaschusetts Fisheries and Game Commission for the extermination of dog-fish in waters of the state and the off-shore fishing grounds. The bill was presented by Representative McIntire, of Gloucester, who has become famous all along the coast because of his advocacy of some plan to exterminate dog-fish and at the same time make the proposition a practical commercial one. It is proposed to find a use for the dog-fish carcass and its oil. If any of our readers have any suggestions to make regarding how the extermination of the dog-fish can be made a commercial success, the father of the bill, Representative McIntire, of Gloucester, Mass., would be grateful to receive them.

Up to a few days ago the port of Boston had exported a total of 417,216 barrels of apples, as against 509,228 barrels last year.

An appropriation of $1,800,000 has been made by the government for the purchase of the three colliers, Everett, Malden and Melrose, recently constructed by the Fore River Ship Building Co., for the Massachusetts Steamship Co. This means that the Massachusetts Steamship Co. will replace the three colliers in question with three others of the same type and they will be constructed by the Fore River Ship Building Co.

The Leyland liner Columbian sailed Saturday for London with a small cargo. Thirty-two thousand bushels of wheat were taken instead of ballast at the rate of eight bushels for a penny, the lowest rate ever quoted. Included in the cargo of the Columbian will be 20 carloads, containing 5,231 boxes of poultry, the first ever sent from Boston to the English metropolis.

Representatives O'Connell and Gardner were the only Massachusetts representatives voting for the amendment for four battleships instead of two in the house of representatives recently when the naval appropriation bill came up to be acted upon.

A $5,000 fire occurred the latter part of last week in the five-story stone warehouse on Union wharf, owned by the Eastern Steamship Co. The loss is confined to the stored cotton, etc., in the building, owned by different Boston firms, which is fully covered by insurance.

Calvin Austin, president of the Metropolitan Steamship Co., is authority for the announcement that on May 11 he will once more place in commission on the Metropolitan line the twin-turbine steamships Harvard and Yale, which, when placed in commission last September, attained immediate popularity. The schedule this season will be the same as last. In other words, the Harvard and Yale, alternating, will leave New York and Boston every evening (Sundays included) at 5 o'clock, arriving the following morning by 9 o'clock.

The decree of the Circuit Court of Maine granting permission to the receivers of the Metropolitan Steamship Co. to issue certificates to the amount of $80,000 has been confirmed by Judge Lacombe in the United States Circuit Court. The receivers' certificates are to be used to pay taxes to the city of Boston on Union wharf amounting to $11,474; for maintaining insurance on the company's property, and repairs to the steamships Yale and Harvard.

The city of Boston has just awarded to William L. Miller, general contractor and bridge builder, Boston and Brunswick, Ga., the contract for building a sea wall on the new Northern Avenue extension to South Boston. The contract calls for the building of a heavy granite and concrete sea wall 220 ft. long, a dry rubble wall 175 ft. long, and a timber bulkhead 185 ft. long. Incidental to the work there is considerable dredging to be done, and about 10,000 cu. yds. of fill to make. The difficulties of this work lie in the great depth at which the concrete foundation is laid, this starting at grade minus 25, the wall at this depth is 23 ft. wide, and is carried up on a batter and at grade minus 1, is 15 ft. wide. Upon this the granite superstructure is built up to the street level. The plans for the work are from the office of the city engineer of Boston, and work to be completed by Oct. 15, 1908.

The Swampscott, the old ferry boat on the Revere Beach and Lynn route, will be hauled off and sold to parties in Maine. She will be replaced by the new ferry boat Newtown just completed.

The new ocean-going tug, Western, now building at Camden, N. J., will arrive here and go into commission some time next month. The western is a sister tug of the Ontario recently put into commission.

The three-masted schooner Charles Lawrence, which has been lying at Key's wharf, Charlestown, for nearly a year, has been sold at United States marshal sale. She was bid in by David Simpson for $1,100. The schooner was libeled for wharfage and other bills, and her sale was ordered to satisfy the libel.

A share of $255 a man for the past month is the record of the crew of schooner Mettacomet, Capt. Charles Nickerson, one of the little local schooners of the market fleet. This is remarkable work.

Schooner Marguerite Haskins, of the southern seining fleet, which was slightly damaged at Delaware breakwater and went to Philadelphia to haul out for examination and repairs,

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met with another mishap for in being hauled out at the Cramps' ship yard, she heeled over on the ways.

The three-masted schooner Abbie and Eva Hooper, which went aground on Handkerchief shoals, April 23, was floated the next day at high water by the tug Orion, after about two-thirds of her cargo of lumber had been jettisoned. The schooner, leaking slightly, was towed to Vineyard Haven.

G. H. C.

THE LOOKOUT.

The German government laid a bill before the Bundesrath granting an additional yearly subsidy of $125,000 to the North German Lloyd Steamship Co. for maintaining monthly sailings between New Guinea, the German South Sea Islands, Australia and Japan.

A recent issue of the *Christian Science Sentinel* contained the following statement from Mrs. Baker C. Eddy: "For many years I have prayed daily that there be no more war, no more barbarous slaughtering of our fellow beings; prayed that all the peoples on earth and the islands of the sea have one God, one mind; love God supremely, and love their neighbor as themselves. National disagreements can be, and should be, arbitrated wisely, fairly, and fully settled. It is unquestionable, however, that at this hour the armament of navies is necessary, for the purpose of preventing war and preserving peace among nations."

The grain exported from the port of Portland, Me., for the winter season just ended amounted to 5,142,181 bush., as against 4,592,076 bush. the preceding year.

Sailings orders have been received by Commander Burns T. Walling of the new scout cruiser Birmingham, which was recently turned over to the government by the Fore River Ship Building Co., now fitting out at the Charlestown navy yard, and the ship will start on her first cruise Friday. After taking on a supply of ammunition at the naval magazine on Iona Island, N. Y., the ship will have a shakedown cruise which will end at Guantanamo, Cuba.

An omnibus lighthouse bill has been introduced by Representative Mann, of Illinois. It includes among other provisions an item of $200,000 for a tender for the First lighthouse district, which embraces the coast of northern New England. In the Third district a light and signal or whistling buoy, fitted with a submarine bell, is authorized for Point Judith, R. I., at a cost of $9,000. The bill also contains provisions somewhat similar to the Lovering bill to increase the efficiency of the life-saving service. One ration per day is authorized to be given every lighthouse keeper and assistant keeper, or commutation in lieu thereof at the rate of 30 cents a day. The bill was reported favorably by the interstate and foreign commerce commission of the house. The bill, concordant with the president's recommendation, provides that in case of the death by reason of perilous service or any wound or injury received or disease contracted in the line of duty, of any lighthouse keeper or assistant keeper, his salary shall be paid for two years to his beneficiaries. The bill provides a fine of $100 for neglect to maintain a light on any bridge over navigable waters, each day's failure to constitute a new offence.

The North Dakota, the 20,000-ton battleship building by the Fore River Ship Building Co., at Quincy, Mass., was more than one-quarter completed on April 1, according to a report received from the navy department. Her keel was laid on Dec. 16 last as the battleship fleet was steaming out of Hampton Roads on its long cruise to the Pacific coast. The Delaware, a sister ship to the North Dakota, was 18.10 per cent completed on April 1. She is being built by the Newport News Ship Building & Dry Dock Co., of Newport News, Va.

A new question has arisen in connection with the fishing rights of American vessels in Canadian waters. In addition to prohibiting the use of trawls in codfishing off the Newfoundland coast by a local regulation, the Newfoundland authorities have also forbidden the use of trawls off the coast of Labrador until after Aug. 15. This regulation, if enforced, it is said, will put the Gloucester fishing fleet to great inconvenience and loss, because after fishing off the banks for a time, the American vessels work northward and ply their trade off the Labrador coast during the summer. If they cannot use trawls at that time, Representative Gardner says they will suffer hardship. Mr. Gardner is seeing what can be done about the matter. It is difficult to meet the situation presented, because the Gloucester fleet has already sailed for the banks.

Four men were injured and others narrowly escaped by the explosion of less than a pint of gasoline in the forecastle of the sloop Maxwell, of Boston. The force of the explosion tore up the floor of the cabin and caused the planks on the side of the vessel to bulge far out of their places. The fire department was called to put out the blaze. The crew were making preparations to sail and were filling the gasoline tank for the 20-H. P. engine which the vessel carries. But a little more than a cupful of the liquid was spilled. The fumes were carried to the fore part of the vessel. It is supposed that the fumes coming in contact with the heat of the cooking stove caused the explosion.

Immigration into the United States in March decreased 76 per cent as compared with the same month of 1906, and 77 per cent as compared with 1907. The total number of immigrants arriving in this country last month was 32,517, as against 139,118 in March a year ago. The country showing the greatest decrease is Italy. In March, 1907, there were 41,454 Italian immigrants, but only 6,612 in March, 1908. Hungary stood next with a total of 27,367 for March, 1907, as against 1,804 for March of this year. In March, 1907, 3,400 Japanese arrived here as against 1,202 for last month. In March, 1906, Russia contributed 24,202 toward our population, and in March, 1907, 21,275, while in March just passed only 5,469 arrived from that country.

The battleships Maine and Alabama will be detached from the Atlantic battleship fleet May 13 and organized into a special service squadron, under the command of Captain Giles B. Harber, commanding the Maine. This squadron is under orders to leave San Francisco June 5 and proceed to the Atlantic coast by way of Honolulu, Guam, the Philippines and the Suez canal. Their places in the fleet will be taken by the battleships Wisconsin and Nebraska.

The United States scout cruiser Chester went into commission at the Portsmouth, N. H., navy yard April 25. The big cruiser went into the harbor at a lively gait, and despite her great length, 420 ft., rounded Henderson's Point against the full force of the ebb tide without assistance and swung up to her place off the navy yard as easily as if she had been a yacht. After the ship was turned over to Commander H. B. Wilson, acting captain of the yard, by Commander Hoff, the hustle to get the ship ready for sea began. It is expected that the Chester will remain at the navy yard some time, as there are alterations to be made and the ship is to be docked.

The materials which constitute a ship become one as soon as she is

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launched, but a vessel in process of construction is not a vessel "engaged in navigation." Where the frame of the hull is not broken up in rebuilding, the vessel retains its name and identity—it is regarded as the same vessel in law; but where each timber is first dislocated before being used in the new vessel, though the model be preserved, it is regarded as a new vessel, and the name may be changed. A vessel launched and afloat on navigable waters is a vessel built.

G. H. C.

ATLANTIC COAST GOSSIP.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

The White Star line has announced that the keels of the proposed steamships, which will be the largest in the world, will be laid down in the Harland & Wolff yards at Belfast within two months. The vessels will be at least 840 ft. in length and 78 ft. beam, their tonnage to be from 45,000 to 50,000. The propelling machinery will consist of both turbine and reciprocating engines and the minimum speed will be 21 knots.

The new North German Lloyd line steamer Lutzow arrived at New York on April 23, from Bremen, on her maiden voyage. The Lutzow is of the Bulow and Sudlitz type of the same line. Her general dimensions are: Length over all, 481 ft. 6 in.; beam, 67 ft. 4 in.; depth, 59 ft. She has accommodation for 107 first class, 115 second class, 152 third class, and 1,400 steerage passengers. She was built at Bremen, and is of 8,815 gross tons.

The old monitor Canonicus, recently sold by the government, has been towed from the Norfolk navy yard to Philadelphia, there to be broken up for the old iron and copper used in her construction. The Canonicus, which stood the fire of the Confederates off Fort Moultrie during the civil war, and escaped with only a few dents, was built by Harrison Loring at Boston, in 1862. Her speed was about 5½ knots. She was exhibited at the Jamestown exposition as the civil war type of monitor.

The British steamship Rotterdam arrived at Newport News on April 24, two weeks overdue, owing to a breakdown of her machinery. The Rotterdam had been reported as disabled by incoming vessels.

The three-masted schooner Abbie and Eva Hooper, which ran aground on Handkerchief Shoal, Mass., was floated on Friday night after about two-thirds of her cargo of lumber had been jettisoned. The Hooper was bound from St. John, N. B., for New York, and was taken in tow to Vineyard Haven.

The new steamer Martha Washington, owned by the Austrian Lloyds, arrived at New York, from Greenock, on Saturday. The Martha Washington is here on her maiden voyage, and will go into service between New York and Trieste, touching at intermediate ports in Italy and Sicily. She is a twin-screw steamer of 8,145 gross tons, with a speed of 17½ knots, and has accommodations for 56 first class, 150 second class, and 2,000 third class passengers.

The British steamer Kelvinhead, which struck on the bar off Porto Padre, Cuba, and afterwards beached, has been floated and will proceed to Nuevitas.

A summer service from New York to Quebec, calling at Halifax and Charlottestown, Prince Edward Island, en route, will be inaugurated on July 4 by the Quebec Steamship Co., which has been running a line of steamers from New York to Bermuda and the West Indies for the past quarter of a century. On July 18 a steamer will go direct to Quebec, arriving there on July 23, carrying passengers desirous of witnessing the ceremonies in celebration of the 300th anniversary of the founding of the city and obtaining a view of the British warships under the command of the Prince of Wales.

Owing to her supply of coal running short, the British steamship Joserio, from Japan, for Baltimore and New York, was compelled to put into Bermuda Islands to replenish her bunkers.

The disabled German steamship Deike Rickmers was picked up and towed into Halifax by the British steamship St. Bride, the vessels arriving at that port Saturday morning. The Rickmers left Swansea on April 8, for Philadelphia, to load for Japan. She encountered heavy gales, and, being in ballast, lost the blades of her propeller. She was in a helpless condition when picked up by the St. Bride. She was on her maiden voyage.

The New York & Albany Transportation Co., recently incorporated to carry on a passenger and freight service on the Hudson river, will begin business on May 4. The steamers Saratoga and Frank Jones are being put in readiness for the opening, Pier 53, North river, having been rented as the New York terminal, and the Gould docks at the Albany end.

The Keystone Transportation Co., for service on the Delaware river and bay, has been incorporated at Wilmington, Del.

The disabled French steamer Breiz Huel was towed into the port of St. George on April 27 by the British steamer Sidra, from Philadelphia for Messina. The Briez Huel left Dunkirk, for New York, March 13. On April 14 she broke her rudder. She has been reported from time to time by incoming steamers, the steamship Lucerna, which took her in tow on one occasion, having to abandon her owing to heavy weather and the breaking of the towline.

OBITUARY.

Capt. James F. Snow died at Detroit, Saturday, at the age of 84 years.

Capt. James Richardson, for the past 23 years in the employ of the Niagara Navigation Co., died at Toronto this week. He was 79 years old.

John D. Mesker, marine engineer, died at his home in Cleveland last week. He had been identified with the great lakes for 45 years.

Capt. Murdock McLeod, for 50 years a resident of Kincardine, died last week at the age of 85 years. He had sailed the lakes for many years.

James Ash, well-known vessel man of Buffalo, died on Sunday last. He was president of the Hand & Johnson Tug line until the Great Lakes Towing Co. was formed.

Capt. Francis P. Hackett, head of the Hackett Wrecking Co., died at Amherstburg last week. He was born on Bois Blanc Island. He was 66 years old and had been identified with the lakes all his life, having constructed a number of tugs operating in the lower Detroit river.

FREIGHTER H. M. HANNA JR

(Continued from page 31.)

Craig, C. B. Calder and L. S. Sullivan, of Toledo; G. A. Tomlinson, of Duluth, and F. A. Osborne, of Chicago.

At the conclusion of the launch a dinner was tendered the launching party at the Union Club by James C. Wallace, president of the American Ship Building Co.

The Hanna will be sailed by Capt. Thomas Wilford and her chief engineer will be James Faulkner.

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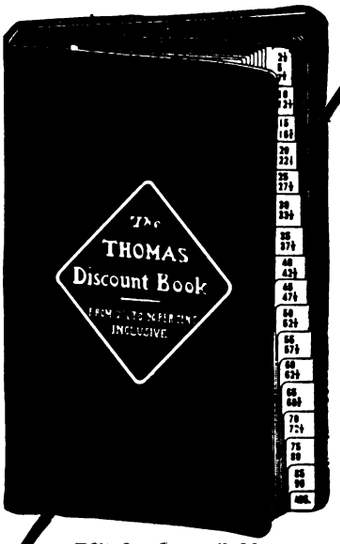

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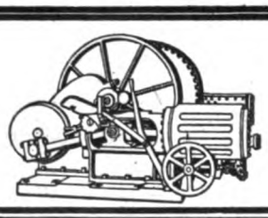
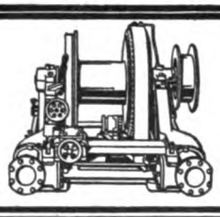
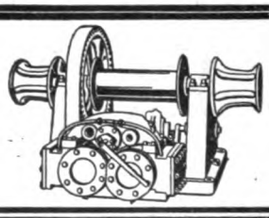

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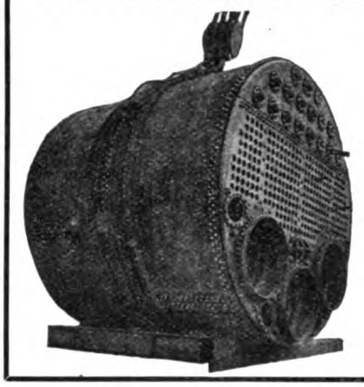

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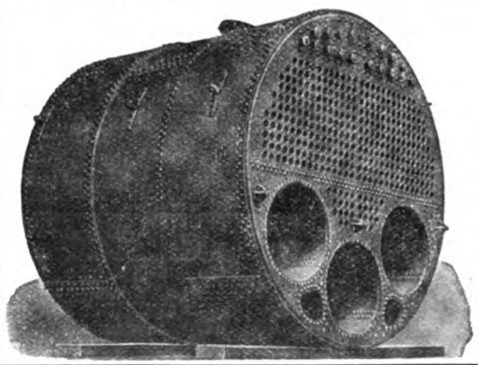

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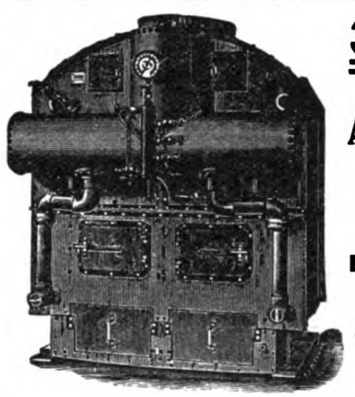

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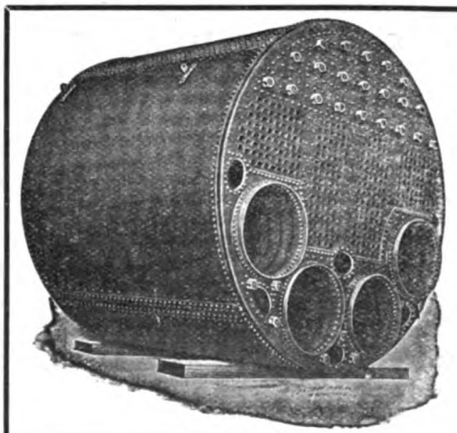

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